

ITS/Operations Resource Guide

2008



traffic incident management

work zones

integrated vehicle based safety systems

electronic freight management

commercial vehicle information systems and networks

mobility services for all Americans

next generation 9-1-1

integrated corridor management systems

SafeTrip-21

clarus

511 traveler information

vehicle infrastructure integration

value pricing

rural safety initiative



Notice

The U.S. Department of Transportation provides high-quality information to serve Government, industry, and the public in a manner that promotes public understanding. Standards and policies are used to ensure and maximize the quality, objectivity, utility, and integrity of its information. U.S. DOT periodically reviews quality issues and adjusts its programs and processes to ensure continuous quality improvement.

Introduction

Dear Reader:

I am pleased to present the U.S. Department of Transportation's (U.S. DOT's) *ITS/Operations Resource Guide 2008*, a comprehensive listing of over 500 documents, videos, websites, training courses, software tools, and points-of-contact related to intelligent transportation systems and other innovative transportation operations strategies. Most resources have been developed under Federal sponsorship, but other useful resources are also included.

New in this eighth edition are:

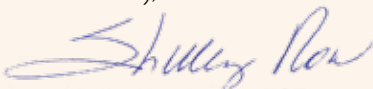
- A chapter on parking management systems that brings together resources related to parking both trucks and private vehicles.
- Software tools for road weather management and transportation operations during biohazard events.
- A training course showing how ITS technologies can be integrated into a regional context to improve transit operations.
- Documents related to automated enforcement, low-cost transportation improvements, planned special events, systems engineering, transit signal priority, transportation system management and operations (TSM&O), traveler information, and work zones.
- Websites related to archived data management systems, congestion pricing, and systems engineering.
- Several resources related to the Emergency Transportation Operations (ETO), Integrated Vehicle-Based Safety Systems (IVBSS), Next Generation 9-1-1 (NG9-1-1), U.S. DOT Rural Safety, and Vehicle Infrastructure Integration (VII) initiatives, including the announcement of the SafeTrip-21 demonstration and testing program.

Resources are grouped by topic area. Each section begins with a list of U.S. DOT points-of-contact, so you always know whom to call. We especially recommend the items listed in the Featured Resources section.

This guide is designed to be a handy desk reference. An online version is also available at <http://www.resourceguide.its.dot.gov>.

This indispensable little book will help you realize the benefits of innovative transportation strategies. If you would like to share your reactions to this Resource Guide, please contact Jane Lappin of the Volpe National Transportation Systems Center at Lappin@volpe.dot.gov.

Sincerely,



Shelley Row, P.E. PTOE
Director
ITS Joint Program Office



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How to Use This Guide

See icon key at bottom.

Topic area appears at the top of each page.



Intelligent Transportation Systems Benefits, Costs, and Lessons Learned: 2005 Update (FHWA-JPO-05-002) (2005)

Resource Title

Publication date and FHWA number - helpful when ordering hardcopies.

This report is the latest in a biennial series that provides a synthesis of the information collected by U.S. DOT on the impact of ITS projects on the operation of the surface transportation network. New in the 2005 edition is a discussion of the ITS Lessons Learned Knowledge Resource, a repository of experience on how to plan, design, deploy, operate, and maintain ITS.

Cost: Free

To Access This Resource:

Access the website address

http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14073.htm, EDL#

14073. To order a hardcopy, contact the Operations/ITS HelpLine, (866) 367-7487 or itspubs@dot.gov.

All documents with an Electronic Document Library number (EDL#) can be downloaded

two ways:

(1) directly from the website address listed or (2) by accessing the main ITS Library website <http://www.its.dot.gov/library.htm>, selecting Profile Search, and searching for the document number.

CTBSSP - Commerical Truck and Bus Safety Synthesis Program, **CVO** - Commercial Vehicle Operations, **FHWA** - Federal Highway Administration, **FMCSA** - Federal Motor Carrier Safety Administration, **FTA** - Federal Transit Administration, **FRA** - Federal Railroad Administration, **NCHRP** - National Cooperative Highway Research Program, **NHTSA** - National Highway Traffic Safety Administration, **NHI** - National Highway Institute, **RTITA** - Research and Innovative Technology Administration, **TCRP** - Transit Cooperative Research Program, **U.S. DOT** - United States Department of Transportation



Points of Contact



Training, Workshops, and Seminars



Websites



Software Tools and Databases



Videos



Documents

An online version of this guide is available at

<http://www.resourceguide.its.dot.gov>.

Use this searchable html file to link directly to website addresses.

Featured Resources

http://

ITS Joint Program Office Website

This site is the official website of the U.S. Department of Transportation's ITS Joint Program Office. The website links to pages relating to all aspects of the National ITS Program, including ten major ITS initiatives. Sections of the website cover special topics, such as architecture, standards, and telecommunications. Technical assistance is available from the ITS Benefits Database, ITS Costs Database, ITS Lessons Learned Knowledge Resource (LLKR), and ITS Deployment Statistics Database, as well as the ITS Learning Center. The website also includes a list of contacts (in the area titled "About Us") and related links, including the ITS Library and National Transportation Operations Coalition (NTOC).

Cost: Free

To Access This Resource: Access the website address <http://www.its.dot.gov>.

http://

National Transportation Operations Coalition Website

This website is a compilation of resources provided by the National Transportation Operations Coalition (NTOC). The Coalition is a partnership of traditional stakeholders, such as transportation professionals, and nontraditional stakeholders, such as public safety agencies. This alliance of national associations, practitioners, and private sector groups allows stakeholders to work collectively to identify barriers and opportunities for improving the management and operations of the nation's transportation system. The site contains the history of the Coalition, current action plan, vision, and mission. The site also contains resource documents that present a number of transportation operations issues and improvement strategies, links to other operations and ITS resources (including electronic forums for transportation operations, and the Talking Operations webcast series), proceedings from Coalition events, and a list of Coalition members and key partner organizations.

Cost: Free

To Access This Resource: Access the website address <http://www.ntoctalks.com>.

http://

NTOC Talks E-Newsletter

NTOC Talks, a newsletter of the National Transportation Operation Coalition (NTOC), is a repository of up-to-date news, insight, and resources related to ITS deployment. The newsletter contains brief summaries of news articles and is updated every few days. The database-driven newsletter features a search engine that allows users to find relevant articles by topic, category, or date going back to 1998. Every month, all articles posted over the past month are compiled into a newsletter that is sent via e-mail to newsletter subscribers. Readers can also have back issues e-mailed to them using a convenient online form. Subscription to the monthly newsletter is free, and the website features online sign-up.

Cost: Free

To Access This Resource: Access the website address <http://www.ntoctalks.com/icdn/index.php3>.

http://

Moving the American Economy: National Strategy to Reduce Congestion Website

This website is a compilation of resources related to the U.S. Department of Transportation's Congestion Initiative, a six-part national strategy to reduce congestion on the country's roads, in its airspace, and at its intermodal ports. The website contains the current status of U.S. DOT solicitations related to the Congestion Initiative, including those for urban partnership agreements, participation in a value pricing pilot program, and an ITS operational test. The website also contains helpful resources, including documents, presentations, and related links. Documents posted on the site include the May 2006 report *National Strategy to Reduce Congestion on America's Transportation Network*, which outlines the U.S. DOT's six-part congestion reduction plan.

Cost: Free

To Access This Resource: Access the website address <http://www.fightgridlocknow.gov>.

http://

National VII Coalition Website

The Vehicle Infrastructure Integration (VII) Initiative is a research program for improving safety and mobility through technology applications that rely on high-speed, real-time communications between vehicles and roadside. VII focuses on enabling development of a common communications platform and developing applications for public safety and traffic management. This website contains program-related documents, announcements, frequently asked questions (FAQs), and information about related initiatives and VII partners. A companion website hosted by the U.S. DOT (<http://www.its.dot.gov/vii/index.htm>) presents the goal, background, approach, milestones, and points-of-contact for the initiative.

Cost: Free

To Access This Resource: Access the website address <http://www.vehicle-infrastructure.org>.

http://

University Transportation Research Centers (UTC) Website

This site is the official website of the University Transportation Centers (UTC) program. The UTC program was created in 1987 to advance state-of-the-art transportation research and develop the next generation of transportation professionals. Currently, about 60 universities have been designated as participants in the program, each of which has a defined research theme. With funding from the UTC program, these universities offer multidisciplinary coursework, conduct basic and applied research, and make the research results available to potential users through technology transfer activities. The website presents the history, vision, mission, and goals of the UTC program, as well as lists the participating universities, their research themes, contact information, and Web links.

Cost: Free

To Access This Resource: Access the website address <http://utc.dot.gov>.



Operations/ITS HelpLine

The Operations/ITS HelpLine provides reliable, personalized assistance, by helping members of the transportation community quickly identify appropriate resources or other technical assistance. The HelpLine functions as a telephone-based gateway to the U.S. DOT National ITS Program, by offering callers access to documents, information on the status of research and development programs, and the ability to identify U.S. DOT personnel with the capabilities to provide additional technical assistance. The HelpLine is also the gateway to the ITS Peer-to-Peer Program that provides public sector transportation stakeholders with a convenient way to tap into the growing knowledge base of ITS experience. Through the program, public sector staff can request short-term assistance to address specific technical issues. The program matches callers with the appropriate individual from a pool of more than 100 “peers”—experts in various topic areas of ITS. The program is free and confidential. For more information about the program, access the website address <http://www.its.dot.gov/peer/index.htm> or call (888) 700-PEER, (888) 700-7337.

Cost: Free

To Access This Resource: Call the HelpLine at (866) 367-7487.



ITS Library

The Electronic Document Library (EDL) is a repository of documents produced under the sponsorship of the National ITS Program, as well as contributions from outside sources. Types of documents posted on the website include technical reports, policy reports, presentations, conference proceedings, brochures, and legislation. The library currently contains almost 2,000 documents. Users can search the EDL by document number, title, publication number, author, or state, as well as conduct a full text search of selected documents. Users can also see what documents have been added to the EDL during a certain period of time, as well as download instructions for contributing documents to the library.

Cost: Free

To Access This Resource: Access the website address <http://www.its.dot.gov/welcome.htm>.



National Transportation Library

The National Transportation Library (NTL) is a repository of materials—documents, statistics, current research activities, technical terms, and legislative and regulatory resources—accessible by using several interactive search tools. The NTL Integrated Search searches both NTL's own catalog as well as the Transportation Research Board's Transportation Research Information Service (TRIS Online). The NTL website links to the departments of transportation in all 50 states, as well as dozens of transportation libraries, trade unions, and professional associations. NTL's extensive legislative and regulatory resources include *Federal Register* notices, the Code of Federal Regulations (CFR), the U.S. Code (USC), U.S. DOT Docket Management System, U.S. DOT Office of the Inspector General (OIG) reports, and the THOMAS Federal Legislative Information system. Technical support is available from the NTL librarians by e-mail or by telephone during Eastern Time business hours.

Cost: Free

To Access This Resource: Access the website address <http://ntl.bts.gov>.



SafeTrip-21 Field Test Sites and ITS Applications (2008)

This Broad Agency Announcement (BAA) solicits organizations to participate in a project called SafeTrip-21, i.e., field tests of various vehicle infrastructure integration (VII) technologies. Such VII technologies include in-vehicle alerts, crash avoidance systems, traveler information systems, navigation systems, transit signal priority systems, commercial vehicle applications, and e-payment applications. Selected systems will be demonstrated at the 15th World Congress on Intelligent Transport Systems in New York City, in November 2008. Other field tests and demonstrations will continue throughout 2010. The viability of the technologies' business models will also be assessed. The BAA consists of a synopsis issued prior to the solicitation, the solicitation itself, five modifications that answer questions about the solicitation, and other materials. The BAA was issued in February 2008 and responses were due in March.

Cost: Free

To Access This Resource: Access the website address <https://www.fbo.gov/?s=opportunity&mode=form&tab=core&id=b2c55271335a4ca6df9623f7b96b998a>. For more information about SafeTrip-21, contact Gary Ritter of the Volpe National Transportation Systems Center, (617) 494-2716, Ritter@volpe.dot.gov.



Five-Year ITS Program Plan (FHWA-JPO-07-015) (2006)

This program plan documents the history, structure, and goals of the national ITS program. The plan describes current activities (as of 2006) and maps out investments planned for the next five years (2006-2010). Last updated in 2000, the 2006 edition outlines the significant changes that will be made to its direction for the ITS program to give greater emphasis to ITS technologies that address the Congestion Initiative. ITS technologies that facilitate congestion pricing, speed traffic flows on arterials, and enhance the value of transit will receive particular attention and resources. A new edition is scheduled for publication fall 2008.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS HelpLine, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14289/14289.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14289.htm, EDL# 14289



National Strategy to Reduce Congestion on America's Transportation Network (2006)

This white paper discusses the common causes, severity of impacts, and current trends regarding transportation congestion in the U.S. Congestion, both in surface transportation and in air travel, is a severe and growing problem in the U.S., but it is a problem that can be addressed. The paper outlines a six-point

plan that the U.S. DOT will follow to reduce air and surface transportation congestion. Publication of this white paper initiated the Congestion Initiative by the Secretary of U.S. DOT.

Cost: Free

To Access This Resource: Access the website address <http://isddc.dot.gov/OLPFiles/OST/012988.pdf>.



Intelligent Transportation Systems Benefits, Costs, and Lessons Learned: 2005 Update (FHWA-JPO-05-002) (2005)

This report is the latest in a biannual series that provides a synthesis of the information collected by U.S. DOT on the impact of ITS projects on the operation of the surface transportation network. The report presents ITS impacts according to program areas within the intelligent infrastructure and intelligent vehicle applications. ITS benefits are classified by performance measures associated with National ITS Program goals, i.e., the improvement of safety, efficiency, mobility, productivity, and energy/environmental impacts. The report also presents unit cost figures for selected ITS deployments, as well as sample system cost information. New in the 2005 edition is a discussion of the ITS Lessons Learned Knowledge Resource, a repository of experience on how to plan, design, deploy, operate, and maintain ITS. Information in the report is drawn from the ITS Benefits and Costs Databases, available online at <http://www.benefitcost.its.dot.gov>. A new edition, which will include data on the extent of U.S. deployment of ITS technologies, is scheduled for publication fall 2008.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS Helpline, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14073_files/14073.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14073.htm, EDL# 14073



Traffic Congestion and Reliability: Trends and Advanced Strategies for Congestion Mitigation (2005)

This document is the second in a series of annual reports that provide a snapshot of congestion in the U.S. The report summarizes recent trends in congestion and analyzes the sources of congestion and of other unreliable travel. In particular, the report examines travel time and travel time reliability as measures of congestion. The report concludes that available solutions—adding capacity, operating capacity more efficiently, and reducing demand—must be used in concert to achieve realistic results. The 2004 report *Traffic Congestion and Reliability: Linking Solutions to Problems* is also available.

Cost: Free

To Access This Resource: Access the following website addresses:

- 2005 Report—Adobe Acrobat format:
http://www.ops.fhwa.dot.gov/congestion_report/congestion_report_05.pdf
- 2005 Report—HyperText Markup Language (HTML) format:
http://www.ops.fhwa.dot.gov/congestion_report/index.htm
- 2004 Report—Adobe Acrobat format:
http://www.ops.fhwa.dot.gov/congestion_report_04/congestion_report.pdf
- 2004 Report—HyperText Markup Language format:
http://www.ops.fhwa.dot.gov/congestion_report_04/index.htm



AASHTO Strategic Highway Safety Plan (2004)

In 2003, the Association of American State Highway and Transportation Officials (AASHTO), the U.S. Department of Transportation and several other organizations set a shared goal to reduce the U.S. highway fatality rate by 2008 to not more than one fatality per 100 million vehicle miles traveled (VMT). As a first step in achieving this goal, AASHTO worked in concert with the Transportation Research Board (TRB) and many other stakeholders to update its *Strategic Highway Safety Plan (SHSP)*. This plan sets 22 specific goals, each organized into one of six core elements of fatal highway crashes: drivers, special users (including non-motorized users), vehicles, highways, emergency medical response, and management. First published in 1997, the 2004 edition uses fatal

crash data from 2003 and discusses the Lead States program and the levels of funding that would be needed to implement the plan. Through the TRB's National Cooperative Highway Research Program (NCHRP) Project 17-18(03), a series of guides is being developed to assist state and local agencies in reducing injuries and fatalities in each of the SHSP's targeted emphasis areas. Published as volumes of NCHRP Report# 500 *Guidance for Implementation of the AASHTO Strategic Highway Safety Plan*, each guide contains a general description of the problem, strategies and countermeasures to address the problem, and a model implementation process; 18 guides have been published as of January 1, 2008. Taking a broader view, NCHRP Report# 501 *Integrated Management Process to Reduce Highway Injuries and Fatalities Statewide* provides an overall framework for coordinating a safety program at the state level.

Cost: Free

To Access This Resource: Accesses the website addresses:

- AASHTO Strategic Highway Safety Plan:
<http://safety.transportation.org/doc/Safety-StrategicHighwaySafetyPlan.pdf>
- AASHTO Strategic Highway Safety Plan Implementation Website: <http://safety.transportation.org/about.aspx>
- NCHRP Report# 500: Guidance for Implementation of the AASHTO Strategic Highway Safety Plan:
<http://safety.transportation.org/guides.aspx>
- NCHRP Report# 501: Integrated Management Process to Reduce Highway Injuries and Fatalities Statewide:
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_501.pdf
- NCHRP Project 17-18(03) Website: <http://www.trb.org/TRBNet/ProjectDisplay.asp?ProjectID=435>

Points-of-Contact



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Freeway Management and Operations Points-of-Contact

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Clarus Points-of-Contact

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- Paul Pisano, FHWA Office of Transportation Operations, (202) 366-1301, Paul.Pisano@dot.gov



Clarus Website

The *Clarus* (Latin for “clear”) Initiative aims to deploy an integrated road weather observational network and data management system that is national in scope. The initiative will build upon the road weather information systems (RWIS) that many state departments of transportation have been deploying for years, primarily in support of winter maintenance activities. This website presents the goals, background, approach, milestones, and points-of-contact for the initiative.

Cost: Free

To Access This Resource: Access the website address <http://www.its.dot.gov/clarus/index.htm>.



Clarus Initiative Website

This site is a compilation of resources related to the *Clarus* Initiative. The website contains a *Clarus* flier, frequently asked questions (with answers), briefings presented at past meetings of the *Clarus* Initiative Coordinating Committee (ICC), the *Clarus* Concept of Operations, project design documents, the status of state agency contributions to *Clarus*, information on the *Clarus* regional demonstrations, contacts, and related links. The website also links to the *Clarus* System software tool, which is currently available to the transportation community on an experimental basis.

Cost: Free

To Access This Resource: Access the website address <http://www.clarusinitiative.org>.



Clarus System

The *Clarus* System is a software tool currently available for use by the transportation community on an experimental basis. The *Clarus* System compiles and distributes weather observations from environmental sensor stations (ESSs) in 11 U.S. states and three Canadian provinces. Users can search the system's total population of ESSs by contributing agency or by geospatial coordinates (latitude and longitude). Data may be downloaded in several formats compatible with many common database management software systems. Users may choose to receive weather observations at 20-minute intervals from selected ESSs on a subscription basis. (The *Clarus* System generates a subscription-specific link on the <http://www.clarus-system.com> website.) This prototype software has been made available to the transportation community for the purposes of demonstration, evaluation, and refinement of future versions of the software.

Cost: Free

To Access This Resource: Access the website address <http://www.clarus-system.com>.



Clarus: A Clear Solution for Road Weather Information (2007)

This flier describes the *Clarus* system as the 21st century's answer to the need for timely, high-quality road weather information. The flier describes *Clarus*' benefits for transportation managers, weather information providers, and the traveling public. The flier also includes perspectives of state departments of transportation personnel who will benefit from the system's ability to standardize road weather data across multiple jurisdictions and multiple regions.

Cost: Free

To Access This Resource: To order a hardcopy, contact Paul Pisano, FHWA Office of Transportation Operations, (202) 366-1301, Paul.Pisano@dot.gov. For the online version, access the website address http://www.clarusinitiative.org/documents/Clarus_TRB_2007flyer_rev.pdf.



Weather Applications and Products Enabled through Vehicle Infrastructure Integration (VII): Feasibility and Concept Development Study (FHWA-HOP-07-084) (2007)

Vehicle Infrastructure Integration (VII) involves two-way wireless transmission of data from vehicles to other vehicles and from vehicles to the roadside. If implemented nationwide, VII has the potential to make enormous amounts of data available to many different types of ITS applications, including road weather applications. This report assesses the feasibility of using VII-enabled data to enhance road weather products and services. The report inventories what weather data elements are already available on board most vehicles, such as temperature, humidity, precipitation, and light level. The report provides an analysis of existing road weather products and services that could be enhanced by vehicle-based weather data, as well as entirely new products and services that such data could make possible. The report presents the results of a case study from Detroit, Michigan that evaluated the accuracy of on-board data elements as compared with data from conventional weather monitoring equipment. The report concludes with recommendations for future research.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://www.ops.fhwa.dot.gov/publications/viirpt/viirpt.pdf>
- HyperText Markup Language (HTML) format: <http://www.ops.fhwa.dot.gov/publications/viirpt/index.htm>



Clarus Concept of Operations (FHWA-JPO-05-072) (2005)

This document provides a high-level definition of how the *Clarus* system works. The document identifies the needs of stakeholders, who have various requirements for the types of content, timeliness, level of detail, extent of value-added processing, and reliability of surface transportation weather data. The document also outlines how the *Clarus* system can be structured to meet these needs. The document concludes with several scenarios showing how various stakeholders will be served by the system.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14158_files/14158.pdf
- HyperText Markup Language (HTML) format:
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14158.htm,
EDL# 14158



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Cooperative Intersection Collision Avoidance Systems Website

The Cooperative Intersection Collision Avoidance Systems Initiative aims to reduce crossing path crashes through the use of cooperative (infrastructure- and vehicle-based) collision avoidance systems. This website presents the goal, background, approach, milestones, and points-of-contact for the initiative.

Cost: Free

To Access This Resource: Access the website address <http://www.its.dot.gov/cicas/index.htm>.



Cooperative Intersection Collision Avoidance Systems: A Major ITS Initiative (FHWA-JPO-05-020) (2005)

This one-page brochure provides an overview of the Cooperative Intersection Collision Avoidance Systems (CICAS) Initiative. It describes the CICAS Initiative's goals and steps that will be taken to achieve these goals.

Cost: Free

To Access This Resource: Access the website address http://www.its.dot.gov/cicas/docs/cicas_factsheet.pdf.



Electronic Freight Management Points-of-Contact

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http://

Electronic Freight Management Website

The Electronic Freight Management Initiative aims to improve efficiency and productivity of the transportation system through the implementation of a common electronic freight framework. If successfully implemented nationwide, this new electronic manifest could have the effect of entirely eliminating paper from the goods tracking system. The initiative will test the concept first at the truck-air freight interface, and then move on to other modal interfaces, such as truck-truck, truck-rail, rail-sea, and truck-sea. This website presents the goal, background, approach, milestones, and points-of-contact for the initiative.

Cost: Free

To Access This Resource: Access the website address <http://www.its.dot.gov/efm/index.htm>.



Emergency Transportation Operations Points-of-Contact

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- Kimberly Vasconez, FHWA Office of Transportation Operations, (202) 366-1548, Kimberly.Vasconez@dot.gov



Emergency Transportation Operations Website

The Emergency Transportation Operations Initiative aims to foster safer and more effective planned and no-notice evacuations. ITS technologies being examined for use in this initiative include real-time traveler information systems, monitoring of evacuation routes, and other decision-support tools that can be used to actively manage and expedite the safe progress of an evacuation. This website presents the goal, background, approach, milestones, and points-of-contact for the initiative.

Cost: Free

To Access This Resource: Access the website address <http://www.its.dot.gov/eto/index.htm>.



Emergency Transportation Operations Section of the FHWA Office of Operations Website

This website is a compilation of information related to emergency transportation operations. The website contains links to numerous publications in the areas of emergency prevention (i.e., transportation security), preparedness, response, recovery, and military deployment. The website also contains a list of high-profile emergency evacuations from around the world.

Cost: Free

To Access This Resource: Access the website address <http://www.ops.fhwa.dot.gov/opssecurity/index.htm>.



Transportation Operations During Biohazard Events Learning Tool

This software tool presents, in an interactive format, information on transportation operations during emergencies involving biohazards, which include bacterial diseases, viruses, and biological toxins. A biohazard event can be either natural or man-made, either accidental or intentional. The software tool discusses the role of transportation systems in release and spread of biohazards, as well as the role transportation agencies can play in mitigating biohazard events. The tool presents an operational concept for emergency management during a biohazard event and proposes communications and ITS technologies that can be used to assist in biohazard emergency response. The tool includes a series of checklists that agencies can use to assess their own readiness for a biohazard event. The report *Final Report for the Application of Technology to Transportation Operations in Biohazard Situations* serves as a basis for this software tool.

Cost: Free

To Access This Resource: Access the website address http://www.its.dot.gov/eto/docs/transops_biohazard/learning_tool/index.htm.



Communicating with the Public Using ATIS During Disasters—A Guide for Practitioners (FHWA-HOP-07-068) (2007)

This report documents the findings of a study on the dissemination of traveler information during disasters, both natural (e.g., hurricanes, earthquakes, avalanches, and fires) and man-made (e.g., hazardous material spills and terrorist attacks). The report explores what information needs to be communicated to evacuees and other travelers during disaster conditions and how Advanced Traveler Information Systems (ATIS) can be used to deliver such information most effectively. The use of ATIS during actual disasters in California, Georgia, Nevada, Utah, and Washington State is profiled in this report. The report presents a concept of operations that characterizes the flow of information among people, organizations, and technologies and recommends developing a local strategy for using ATIS during disasters. The report concludes with a toolkit for conducting a workshop among key stakeholders to develop such a strategy.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/publications/atis/atis_guidance.pdf
- HyperText Markup Language (HTML) format: <http://www.ops.fhwa.dot.gov/publications/atis/index.htm>



Managing Pedestrians During Evacuation of Metropolitan Areas (FHWA-HOP-07-066) (2007)

This report documents the findings of a literature search and interviews with practitioners concerning emergency pedestrian evacuation. Case studies from New York City, New York; Oklahoma City, Oklahoma; and Tokyo, Japan were examined in the literature review. The report presents three approaches for managing pedestrian evacuation: separation of vehicle and pedestrian streams, the use of transit hubs, and the establishment of “bus bridges” from where large numbers of people are emerging from buildings to designated points at the edge of the evacuation area. The report concludes with recommendations for future research.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/publications/pedevac/ped_evac_final_mar07.pdf
- HyperText Markup Language (HTML) format: <http://www.ops.fhwa.dot.gov/publications/pedevac/index.htm>



Tabletop Exercise Instructions for Planned Events and Unplanned Incidents/Emergencies (FHWA-HOP-08-005) (2007)

This document provides instructions on how to conduct a tabletop exercise that tests a regional transportation system’s ability to handle extraordinary situations, such as planned special events and unplanned incidents and emergencies. In a tabletop exercise, participants role play in well-defined scenarios that enable participants to identify unintended effects, vet and resolve

conflicts, and familiarize themselves with their own roles in a transportation management plan. The document outlines roles and responsibilities of each type of participant, including transportation agencies, transit agencies, police/law enforcement, fire and rescue, emergency medical services, emergency management, towing and recovery, representatives of various venues (e.g., areas, stadiums, etc.), event organizers, and mayors' and governors' offices. The document describes 11 objectives that can be the focus of a tabletop exercise and recommends that each exercise focus on between six to eight objectives.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/publications/tabletopexercpe/tabletopexerc_pse.pdf
- HyperText Markup Language (HTML) format: <http://www.ops.fhwa.dot.gov/publications/tabletopexercpe/index.htm>



Using Highways for No-Notice Evacuations: Routes to Effective Evacuation Planning Primer Series (FHWA-HOP-08-003) (2007)

This primer discusses how public agencies can plan and execute emergency evacuations in response to incidents with little or no warning, such as forest fires, major storms, chemical spills, and terrorist attacks. This primer discusses the four stages of evacuation operations—readiness, activation, operations, and return-to-readiness—that are the same for no-notice incidents as for advance warning incidents. The key to effective evacuations during no-notice incidents is preplanning, i.e., training, role-playing, evacuation plan review, and other activities that are undertaken on a continuous basis. This primer discusses how to develop an evacuation plan and the elements needed in such a plan that address no-notice incidents. The primer concludes with several checklists that can be used in reviewing evacuation plans to ensure that all elements necessary for addressing no-notice incidents have been included. This document is one of a series *Routes to Effective Evacuation Planning* on the transportation considerations of emergency evacuation.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/publications/evac_primer_nn/primer.pdf
- HyperText Markup Language (HTML) format: http://www.ops.fhwa.dot.gov/publications/evac_primer_nn/index.htm



Emergency Transportation Operations Preparedness and Response: Results of the FHWA Workshop Series (2006-2007)

Between May 2002 and June 2005, FHWA conducted workshops on transportation operations preparedness and response in 30 regions across the U.S. Each workshop asked participants to consider the scenario of a terrorist attack on their transportation system and to identify both actions they would take to respond to the attack and issues that arose from the discussion. This series of two reports—a best practices report and a common issues report—documents the findings of the workshops. Best practices and common issues are presented in the areas of interagency cooperation and communication; emergency operations; equipment; ITS; mutual aid; threat notification, awareness and information sharing; and policy.

Cost: Free

To Access This Resource: Access the following website addresses:

- Best Practices Report (FHWA-HOP-07-076) (2006)—Adobe Acrobat format: http://www.ops.fhwa.dot.gov/publications/etopr/best_practices/etopr_best_practices.pdf
- Best Practices Report—HyperText Markup Language (HTML) format: http://www.ops.fhwa.dot.gov/publications/etopr/best_practices/etopr_workshop.htm
- Common Issues Report (FHWA-HOP-07-090) (2007)—Adobe Acrobat format: http://www.ops.fhwa.dot.gov/publications/etopr/common_issues/etopr_common_issues.pdf
- Common Issues Report—HyperText Markup Language format: http://www.ops.fhwa.dot.gov/publications/etopr/common_issues/etop_compliance.htm



Final Report for the Application of Technology to Transportation Operations in Biohazard Situations (2006)

This report discusses the role of transportation agencies during emergencies involving biohazards, which include bacterial diseases, viruses, and biological toxins. A biohazard event can be either natural or man-made, either accidental or intentional. The report documents the findings of a literature review and a workshop conducted on July 18, 2005 with representatives of the Wisconsin Department of Transportation. The report presents an operational concept for emergency management during a biohazard event and proposes communications and ITS technologies that can be used to assist in biohazard emergency response. This report serves as a companion to the Transportation Operations During Biohazard Events Learning Tool software.

Cost: Free

To Access This Resource: Access the website address http://www.its.dot.gov/eto/docs/transops_biohazard/executive.htm.



Using Highways During Evacuation Operation For Events with Advance Notice: Routes to Effective Evacuation Planning Primer Series (FHWA-HOP-06-109) (2006)

This primer discusses how public agencies can plan and execute emergency evacuations in response to incidents with advance warning, such as hurricanes during the summer season. The primer discusses the roles and responsibilities of various stakeholders, including emergency managers, transportation officials, decision-makers at the state and local government level, volunteer organizations, and private sector partners. This primer recommends developing an emergency evacuation concept of operations (CONOPS) that can serve as the foundation of an evacuation plan. The primer outlines the four phases of evacuation operations—readiness, activation, operations (including evacuation and re-entry), and return-to-readiness. The primer also discusses tools that agencies can use for effective operations, including

communications, traffic control and weather prediction tools. This document is one of the series *Routes to Effective Evacuation Planning* on the transportation considerations of emergency evacuation.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/publications/evac_primer/primer.pdf
- HyperText Markup Language (HTML) format: http://www.ops.fhwa.dot.gov/publications/evac_primer/00_evac_primer.htm



Integration of Emergency and Weather Elements into Transportation Management Centers (FHWA-HOP-06-090) (2006)

This report documents the findings of a study that examined how weather and emergency information is being integrated into operations at 38 transportation management centers (TMCs) across the country. The study was sponsored jointly by the FHWA Road Weather Management Program and the FHWA Emergency Transportation Operations Program. The report describes the state-of-the-practice in integration of weather and emergency information into TMC operations. The report also identifies best practices, discusses the benefits and challenges of integration, and offers recommendations on how to get started and how to enhance current weather/emergency integration at one's own TMC.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://www.ops.fhwa.dot.gov/weather/resources/publications/tcmintegration/finalrpttmc22806.pdf>
- HyperText Markup Language (HTML) format: <http://www.ops.fhwa.dot.gov/weather/resources/publications/tcmintegration/index.htm>



Effects of Catastrophic Events on Transportation Systems Management and Operations (2002-2004)

This series of reports explores the effects of catastrophic events on transportation systems management and operations. Six case studies examine how transportation systems operators responded to challenges created by recent catastrophic events in the U.S.: the Northridge earthquake in the Los Angeles, California area in 1994, a rail tunnel fire involving hazardous materials in Baltimore in 2001, the terrorist attacks on the World Trade Center and Pentagon on September 11, 2001, and the blackout in New York City and the Great Lakes Region in 2003. An Executive Summary report on the 2003 blackout is available, as well as a cross-cutting study that documents the lessons learned from the events prior to 2002 and a comparative analysis that documents lessons learned from all these events.

Cost: Free

To Access This Resource: Access the following website addresses:

- Northridge Earthquake, January 17, 1994 (2002)—Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13775_files/13775.pdf
- Northridge Earthquake, January 17, 1994—HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13775.html, EDL# 13775
- Howard Street Tunnel Fire, Baltimore City, Maryland July 18, 2001 (2002)—Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13754_files/13754.pdf
- Howard Street Tunnel Fire, Baltimore City, Maryland July 18, 2001—HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13754.html, EDL# 13754
- September 11, 2001: Pentagon (2002)—Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14119_files/14119.pdf
- September 11, 2001: Pentagon—HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14119.htm, EDL# 14119 or http://www.ops.fhwa.dot.gov/opssecurity/case_studies/pentagon911.htm

- September 11, 2001: World Trade Center (2002)—Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14129_files/14129.pdf
- September 11, 2001: World Trade Center—HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14129.htm, EDL# 14129 or http://www.ops.fhwa.dot.gov/opssecurity/case_studies/nycprelim.htm
- August 2003 Northeast Blackout: Great Lakes Region (2004)—Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14021.pdf
- August 2003 Northeast Blackout: Great Lakes Region—HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14021.htm, EDL# 14021
- August 2003 Northeast Blackout: New York City (2004)—Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14023.pdf
- August 2003 Northeast Blackout: New York City—HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14023.htm, EDL# 14023
- August 2003 Northeast Blackout: Executive Summary (2004)—Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14022_files/14022.pdf
- August 2003 Northeast Blackout: Executive Summary—HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14022.htm, EDL# 14022
- Cross-Cutting Study (2002)—Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13780_files/13780.pdf
- Cross-Cutting Study—HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13780.html, EDL# 13780
- Comparative Analysis (2004)—Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14024.pdf
- Comparative Analysis—HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14024.htm, EDL# 14024



Disaster Response and Evacuation User Service: An Addendum to the ITS Program Plan (2003)

This document provides a detailed description of the Disaster Response and Evacuation User Service. This document serves as an addendum to the *National ITS Program Plan* in describing the 33rd ITS user service and establishes the need for including disaster response and evacuation (DRE) in the National ITS Architecture. ITS technologies and services described in the document provide enhanced access to the scene for response personnel and resources, better information about the transportation system in the vicinity of the disaster, and more efficient and safer evacuation of the general public. ITS can also be used to prioritize, allocate, and track personnel and resources for more efficient and effective disaster response.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_pr/14064.html, EDL# 14064.



Integrated Corridor Management Systems Points-of-Contact

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- Steven Mortensen, FTA Office of Mobility Innovation, (202) 493-0459, Steven.Mortensen@dot.gov



Integrated Corridor Management Systems Website

This website provides information on the Integrated Corridor Management (ICM) Systems Initiative. The basic premise of the ICM Initiative is that “the whole is more than the sum of its parts.” The goal of the ICM Initiative is to apply that premise to key transportation corridors. By working together—highways and transit, engineering and planning—and by integrating previously isolated systems, corridor throughput can be increased and mobility can be enhanced. The website contains results from completed activities and points-of-contact.

Cost: Free

To Access This Resource: Access the website address <http://www.its.dot.gov/icms/index.htm>.



Integrated Corridor Management Phase 1—Concept Development and Foundational Research (2006)

This series of technical memoranda lays the foundation for the Integrated Corridor Management (ICM) Initiative. A concept of operations for a generic 15-mile corridor serves as an example that can be used by agencies for developing their own concept of operations. An implementation guide identifies and discusses the steps needed to support the development, implementation, and operation of a ICM system. A definitions document discusses the key attributes included in the ICM Initiative. A criteria document presents concepts that should be considered when delineating corridor boundaries. A white paper discusses the similarities, differences, and interrelationships between ICM and regional

traffic management. Finally, a technical memorandum identifies current modeling tools that support evaluation of various corridor types and ICM operational strategies and recommends enhancements to those tools in areas where the analysis capabilities are insufficient to meet the Initiative's needs.

Cost: Free

To Access This Resource: Access the following website addresses:

- Task 2.3 Concept of Operations for a Generic Corridor—Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14281_files/14281.pdf
- Task 2.3 Concept of Operations for a Generic Corridor—HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14281.htm, EDL# 14281
- Task 2.5 ICM Implementation Guidance—Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14284_files/14284.pdf
- Task 2.5 ICM Implementation Guidance—HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14284.htm, EDL# 14284
- Task 3.2 Develop Criteria for Delineating a Corridor—Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14274_files/14274.pdf
- Task 3.2 Develop Criteria for Delineating a Corridor—HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14274.htm, EDL# 14274
- Task 3.3 Relationship between Corridor Management and Regional Management—Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14275_files/14275.pdf
- Task 3.3 Relationship between Corridor Management and Regional Management—HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14275.htm, EDL# 14275
- Task 5.5 Identification of Analysis Needs—Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14280_files/14280.pdf
- Task 5.5 Identification of Analysis Needs—HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14280.htm



Integrated Vehicle-Based Safety Systems Points-of-Contact

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Integrated Vehicle-Based Safety Systems Website

The Integrated Vehicle-Based Safety Systems (IVBSS) Initiative aims to accelerate deployment of advanced driver safety systems in new light vehicles and heavy commercial trucks. These safety systems will help drivers avoid the most common types of fatal collisions: rear-end, lane-change, and roadway departure. In this initiative, the U.S. DOT is partnering with members of the automotive and heavy truck industries to develop and field test the next generation of advanced safety systems. This website presents program goals, background, approach, milestones, and points-of-contact, as well as announcements of upcoming events and availability of reports.

Cost: Free

To Access This Resource: Access the website address <http://www.its.dot.gov/ivbss/index.htm>.



Public Meeting on the Integrated Vehicle-Based Safety Systems (IVBSS) Initiative Website

This website is a compilation of resources related to the U.S. DOT's public meeting on the Intelligent Vehicle-Based Safety Systems (IVBSS) Initiative, held April 10-11, 2008, in Ypsilanti, Michigan. The website contains proceedings of the meeting, a list of exhibits and demonstrations, IVBSS reports and technical papers, and related links, including links to the IVBSS-related public meetings in 2006 and 2007.

Cost: Free

To Access This Resource: Access the website address <http://www.itsa.org/ivbss.html>.



Integrated Vehicle-Based Safety Systems: Human Factors and Driver-Vehicle Interface (DVI) (DOT-HS-810-905) (2008)

This report describes several studies and pilot tests that assessed a variety of driver-interface concepts related to the development of integrated vehicle-based safety systems (IVBSS). Based on the findings of these assessments, the report makes several recommendations for the design of integrated warnings systems. For example, warning sounds should be at least 80 dB in the 1 to 5KHz range. Auditory warnings should be less than the expected mean response time. A dual-warning approach (e.g., auditory and visual) is preferable over a multi-warning approach, and delays between 150 and 300 milliseconds are acceptable for the lane departure warning (LDW) algorithm.

Cost: Free

To Access This Resource: Access the website address <http://www.nhtsa.dot.gov/staticfiles/DOT/NHTSA/NRD/Multimedia/PDFs/Crash%20Avoidance/2008/810905-Lo.pdf>.



Assessing the Business Case for Integrated Collision Avoidance Systems on Transit Buses (2007)

This document assesses the business case for integrated vehicle-based safety systems (IVBSS) for transit buses. The assessment was conducted in three steps. First, available IVBSS products, possible future IVBSS products and core IVBSS technologies were analyzed. Second, a cost-benefit analysis of these products and technologies was conducted. Third, transit operators were surveyed on their receptiveness to IVBSS products, and manufacturers were surveyed on their willingness to develop products that meet transit operators' needs. Of the IVBSS technologies evaluated, only side object detection systems showed the potential to be cost-effective.

Cost: Free

To Access This Resource: Access the website address http://www.fta.dot.gov/documents/Transit_IVBSS_Business_Case_Analysis_Final_Report_9-07.pdf.



Integrated Vehicle-Based Safety Systems: First Annual Report (DOT-HS-810-842) (2007)

This report describes the accomplishments of and progress made under the Integrated Vehicle-Based Safety Systems (IVBSS) Initiative from November 2005 through December 2006. Under the IVBSS Initiative, the U.S. DOT is partnering with a coalition led by the University of Michigan Transportation Research Institute (UMTRI) to develop and field test the next generation of advanced safety systems. Activities during the first annual reporting period focused on system specification, design and development, and construction of prototype vehicles.

Cost: Free

To Access This Resource: Access the website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14401_files/14401.pdf or http://www.nhtsa.dot.gov/staticfiles/DOT/NHTSA/NRD/Multimedia/PDFs/Crash%20Avoidance/2007/IVBSS_First_Annual_Report_FINAL_PDF_10-10-07.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14401.htm, EDL# 14401



Integrated Vehicle-Based Safety Systems: A Major ITS Initiative (FHWA-JPO-05-019) (2005)

This one-page brochure provides an overview of the Integrated Vehicle-Based Safety Systems (IVBSS) Initiative. It describes the IVBSS Initiative's goals and steps ITS will take to achieve these goals.

Cost: Free

To Access This Resource: Access the website address http://www.its.dot.gov/ivbss/docs/ivbss_factsheet.pdf.



Mobility Services for All Americans Points-of-Contact

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- Aletha Goodine, FTA Office of Mobility Innovation, (202) 366-6678, Aletha.Goodine@dot.gov

<http://>

Mobility Services for All Americans Website

The Mobility Services for All Americans Initiative aims to improve transportation services for elderly, disabled, and low-income people. A variety of transit ITS technologies will be used to achieve this improvement: geographic information systems (GIS), integrated vehicle dispatching and scheduling, automatic vehicle location (AVL), communications systems, electronic payment systems, advanced traveler information systems (ATIS), and financial tracking and billing. This website presents the goal, background, approach, milestones, and points-of-contact for the initiative.

Cost: Free

To Access This Resource: Access the website address <http://www.its.dot.gov/msaa/index.htm>.



Next Generation 9-1-1 Points-of-Contact

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Next Generation 9-1-1 Website

The Next Generation 9-1-1 Initiative aims to enable any communications device used nationwide to connect with the 9-1-1 system. The current 9-1-1 system is built on decades-old technology and cannot receive data from text, data, image and video devices increasingly common in personal communications and critical in many safety and medical applications. This initiative will involve a fundamental reexamination of the technological approach to 9-1-1 used today. This website presents the goal, background, approach, milestones, and points-of-contact for the initiative.

Cost: Free

To Access This Resource: Access the website address <http://www.its.dot.gov/ng911/index.htm>.



E9-1-1 Implementation Coordination Office Website

The E9-1-1 Implementation Coordination Office (ICO) was created by NHTSA, as required by the Ensuring Help Arrives Near Callers Employing 9-1-1 Act (ENHANCE 9-1-1 Act), to provide a focal point for 9-1-1 leadership and help implement a single national vision for 9-1-1 services in the U.S. This website links to government agencies and national organizations involved in 9-1-1 implementation. The website discusses the origin, mission, and responsibilities of the ICO and provides online references to Federal legislation that impact the office. The website also provides links to E9-1-1 websites of states and tribal governments. The website contains materials, such as plans, presentations, studies and strategy reports, from several states and national organizations that can help in the implementation of E9-1-1.

Cost: Free

To Access This Resource: Access the website address <http://www.e-911ico.gov>.



Next Generation 9-1-1 (NG9-1-1) System Initiative: Data Acquisition and Analysis Plan—Version 1.0 (2008)

This document lays out a comprehensive plan for acquiring and analyzing data from the Next Generation 9-1-1 (NG9-1-1) proof-of-concept (POC) demonstration. The POC demonstration will test key features and functionalities of the envisioned NG9-1-1 system. POC equipment will be installed in test laboratories in Texas, Virginia, and New York and at nearby selected Public Safety Answering Points (PSAPs). This document describes the data acquisition system, the data analysis methodology, and the metrics that will be used to assess how well the NG9-1-1 system performed during the test.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.its.dot.gov/ng911/pdf/NG911_DataAcquisition_v1.0.pdf
- HyperText Markup Language (HTML) format: http://www.its.dot.gov/ng911/pubs/data_acquisition.htm



Next Generation 9-1-1 (NG9-1-1) System Initiative: Human Machine Interface Display Design Document—Version 1.0 (2008)

This document describes the design of a human machine interface (HMI) display for the Next Generation 9-1-1 (NG9-1-1) system that meets requirements identified through a requirements analysis process. This document describes methodology used to develop the design, presents the overall HMI design and the display design specifically, and identifies issues that must be considered to achieve standardization of NG9-1-1 displays at Public Safety Answering Points (PSAPs) throughout the country.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.its.dot.gov/ng911/pdf/NG911_HMI_Display_Design_FINAL_v1.0.pdf
- HyperText Markup Language (HTML) format: http://www.its.dot.gov/ng911/pubs/ng911_human_machine.htm



Next Generation 9-1-1 (NG9-1-1) System Initiative: NG9-1-1 Transition Issues Report—Version 1.0 (2008)

This document summarizes key issues facing government, industry and the general public in the transition to a nationwide Next Generation 9-1-1 (NG9-1-1) system. Issues discussed in the report include funding, security and access, responsibility, privacy, routing and prioritization, coordination, standards, liability, and human resources. The report also outlines two developmental frameworks for nationwide NG9-1-1 implementation— independent and coordinated—and discusses the advantages and disadvantages of each.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.its.dot.gov/ng911/pdf/NG911_TransitionIssuesReport_FINAL_v1.0.pdf
- HyperText Markup Language (HTML) format: http://www.its.dot.gov/ng911/pubs/ng911_transition_issues.htm



Next Generation 9-1-1 (NG9-1-1) System Initiative: Preliminary Analysis of Cost, Value, and Risk—Version 2.0 (2008)

This document examines the costs, value, and risk associated with moving from the present 9-1-1 system to a nationwide Next Generation 9-1-1 (NG9-1-1) system, as envisioned in the NG9-1-1 Initiative. The authors analyzed four scenarios: a low-end cost estimate of continuing the current 9-1-1 environment, a high-end cost estimate of continuing the current 9-1-1 environment, a high-end cost estimate of centralized ownership for national deployment of the NG9-1-1 system, and a cost-sharing scenario in which emergency system stakeholders would share additional data, center, and network costs with other local government agencies. The analysis found that NG9-1-1 provides considerably more value than the current 9-1-1 environment while being comparable in cost.

Cost: Free

To Access This Resource: Access the following website addresses:

- Executive Summary—Adobe Acrobat format:
http://www.its.dot.gov/ng911/pdf/NG911_FINAL_ES_PrelimCostValueRiskAnalysis_v2.0_021208.pdf
- Executive Summary—HyperText Markup Language (HTML) format: http://www.its.dot.gov/ng911/pubs/ng911_preliminary_analysis.htm
- Full Report—Adobe Acrobat format:
http://www.its.dot.gov/ng911/pdf/NG911_FINAL_PreliminaryCostValueRiskAnalysis_v2.0_021208.pdf
- Full Report—HyperText Markup Language format:
http://www.its.dot.gov/ng911/pubs/USDOT_NG911_FINAL_PreliminaryCostValueRiskAnalysis_v2.0_021208_files/frame.htm



Next Generation 9-1-1 (NG9-1-1) System Initiative: Proof of Concept Deployment Plan—Version 1.0 (2008)

This document lays out a comprehensive plan testing key features and functionalities of the envisioned Next Generation 9-1-1 (NG9-1-1) system in a proof-of-concept (POC) demonstration. POC equipment will be installed in test laboratories in Texas, Virginia, and New York and at nearby selected Public Safety Answering Points (PSAPs). This document outlines a detailed plan to develop and deploy software components required to successfully demonstrate the capabilities of NG9-1-1. This document includes a detailed timeline and milestones for developing, testing, and deploying POC test-bed components, as well as the configuration management, risk management, maintenance, training, and communication plans and procedures that will be used in the test.

Cost: Free

To Access This Resource: Access the website addresses:

- Adobe Acrobat format: http://www.its.dot.gov/ng911/pdf/NG911_POC_DeployPlan_FINAL_v1.0.pdf
- HyperText Markup Language (HTML) format:
http://www.its.dot.gov/ng911/pubs/NG911_proof_concept.htm



Next Generation 9-1-1 (NG9-1-1) System Initiative: Architecture Analysis Report—Version 1.0 (2007)

This report presents an architecture for the Next Generation 9-1-1 (NG9-1-1) System. Building upon the architecture of the current 9-1-1 system, which supports primarily telephone calls to Public Safety Answering Points (PSAPs), the NG9-1-1 architecture presented in this report supports emergency calls made by any wired, wireless, or Internet Protocol (IP)-based device. The architecture presented in this report also enables PSAPs to receive and forward text messages, images and video that paint a more comprehensive picture of the emergency. The proposed architecture is scalable (can be sized to fit the needs of different sized PSAPs and 9-1-1 authorities), extensible (supportive of future technologies), highly reliable, highly configurable (supporting a wide diversity of PSAPs and 9-1-1 authorities) and interoperable with other NG9-1-1 systems and other public safety entities.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.its.dot.gov/ng911/pdf/1.F2_FINAL_MED_ArchitectureAnalysis_v1.0.pdf
- HyperText Markup Language (HTML): http://www.its.dot.gov/ng911/pubs/NG911_FINAL_ArchAnalysis_v1.htm



Next Generation 9-1-1 (NG9-1-1) System Initiative: Benefit Cost Analysis Approach Document—Version 1.0 (2007)

This MS PowerPoint presentation outlines the approach that will be used by the Next Generation 9-1-1 (NG9-1-1) Initiative to estimate the benefits and costs of NG9-1-1. The cost, value, and risk of the current 9-1-1 system will be compared with those of NG9-1-1. Outputs from the benefit/cost analysis will include identification of which stakeholder groups will experience what benefits depending on which management structure is selected for NG9-1-1, as well as identification of risks so that appropriate mitigation strategies can be developed.

Cost: Free

To Access This Resource: Access the website address http://www.its.dot.gov/ng911/docs/USDOT_NG911_Revised_Benefit%20Cost%20Approach_FINAL_files/frame.htm.



Next Generation 9-1-1 (NG9-1-1) System Initiative: Call Taker Human Factors Issues Report—Version Final (2007)

This report looks into the future of the Next Generation 9-1-1 (NG9-1-1) System and considers human factors issues that may affect integration of NG9-1-1 subsystems into Public Safety Answering Point (PSAP) operations. Human factors issues are grouped into four categories: multimedia interfaces, data and call management, human-machine interface (HMI) technology compatibility issues, and call taker operations and training. This report identifies human factors challenges for PSAPs that may require additional research.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.its.dot.gov/ng911/pdf/NG911_HMI2007_FINAL.pdf
- HyperText Markup Language (HTML) format: http://www.its.dot.gov/ng911/NG911_HMI_2007FINAL.htm



Next Generation 9-1-1 (NG9-1-1) System Initiative: Concept of Operations—Version 2.0 (2007)

This document provides a vision of a Next Generation 9-1-1 (NG9-1-1) system from the perspective of end-users and other stakeholders. This document describes what an NG9-1-1 system is (system overview, system summary), how it would work (operational description, operational scenarios) and what is needed to make an NG9-1-1 system work (operational needs). This concept of operations serves as a foundation for the development of NG9-1-1 requirements, as laid out in *Next Generation 9-1-1 (NG9-1-1) System Initiative: System Description and Requirements Document—Version 2.0*. It is these requirements that drive the design of the overall system.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.its.dot.gov/ng911/pdf/NG911ConOps_April07.pdf
- HyperText Markup Language (HTML) format: http://www.its.dot.gov/ng911/pubs/concept_operations.htm



Next Generation 9-1-1 (NG9-1-1) System Initiative: System Description and Requirements Document—Version 2.0 (2007)

This document examines the activities that comprise a Next Generation 9-1-1 (NG9-1-1) system, e.g., managing call queues, taking a call, determining a call's location, routing a call to the appropriate Public Safety Answering Point (PSAP) to dispatch the appropriate emergency response, and archiving call information. For each activity, the document states what information needs to flow, from whom to whom, in what media (i.e., text, graphics, audio, video, etc.), and how often. These information flows form the basis for requirements that any proposed design for an NG9-1-1 system must fulfill. The document also provides detailed requirements that must be fulfilled in order for an NG9-1-1 system to meet minimum standards of maintainability, availability, and reliability. Finally, the document provides a Community Model of an NG9-1-1 system that shows information flows at a high level among various stakeholders. This Community Model can be used to show stakeholders where they fit in the overall structure of NG9-1-1 and how the requirements presented in this document affect their operations.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.its.dot.gov/ng911/pdf/NG911_HI_RES_Requirements_v2_20071010.pdf
- HyperText Markup Language (HTML) format: http://www.its.dot.gov/ng911/pubs/NG911_FINAL_Requirements_v2.htm



Vehicle Infrastructure Integration Points-of-Contact

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<http://>

Vehicle Infrastructure Integration Website

The Vehicle Infrastructure Integration (VII) Initiative is a research program to improve safety and mobility through applications that rely on high-speed, real-time communications between vehicles and roadside infrastructure. The research program is focused on enabling deployment of a common communications platform and data set, as well as applications for public safety and traffic management. This website presents the goal, background, approach, milestones, and U.S. DOT points-of-contact for the initiative. A companion website hosted by the National VII Coalition (<http://www.vehicle-infrastructure.org>) contains program-related documents, announcements, frequently asked questions (FAQs), and information about related initiatives and VII partners.

Cost: Free

To Access This Resource: Access the website address <http://www.its.dot.gov/vii/index.htm>.



National VII Coalition Website

The Vehicle Infrastructure Integration (VII) Initiative is a research program for improving safety and mobility through technology applications that rely on high-speed, real-time communications between vehicles and roadside. VII focuses on enabling development of a common communications platform and developing applications for public safety and traffic management. This website contains program-related documents, announcements, frequently asked questions (FAQs), and information about related initiatives and VII partners. A companion website hosted by the U.S. DOT (<http://www.its.dot.gov/vii/index.htm>) presents the goal, background, approach, milestones, and points-of-contact for the initiative.

Cost: Free

To Access This Resource: Access the website address <http://www.vehicle-infrastructure.org>.



SafeTrip-21 Field Test Sites and ITS Applications (2008)

This Broad Agency Announcement (BAA) solicits organizations to participate in a project called SafeTrip-21, i.e., field tests of various vehicle infrastructure integration (VII) technologies. Such VII technologies include in-vehicle alerts, crash avoidance systems, traveler information systems, navigation systems, transit signal priority systems, commercial vehicle applications, and e-payment applications. Selected systems will be demonstrated at the 15th World Congress on Intelligent Transport Systems in New York City, New York in November 2008. Other field tests and demonstrations will continue throughout 2010. The viability of the technologies' business models will also be assessed. The BAA consists of a synopsis issued prior to the solicitation, the solicitation itself, five modifications that answer questions about the solicitation, and other materials. The BAA was issued in February 2008 and responses were due in March.

Cost: Free

To Access This Resource: Access the website address <https://www.fbo.gov/?s=opportunity&mode=form&tab=core&id=b2c55271335a4ca6df9623f7b96b998a>. For more information about SafeTrip-21, contact Gary Ritter of the Volpe National Transportation Systems Center, (617) 494-2716, Ritter@volpe.dot.gov.



Weather Applications and Products Enabled through Vehicle Infrastructure Integration (VII): Feasibility and Concept Development Study (FHWA-HOP-07-084) (2007)

Vehicle Infrastructure Integration (VII) involves two-way wireless transmission of data from vehicles to other vehicles and from vehicles to the roadside. If implemented nationwide, VII has the potential to make enormous amounts of data available to many different types of ITS applications, including road weather applications. This report assesses the feasibility of using VII-enabled data to enhance road weather products and services. The report inventories what weather data elements are already available on board most vehicles, such as temperature, humidity, precipitation, and light level. The report provides an analysis of existing road weather products and services that could be enhanced by vehicle-based weather data, as well as entirely new products and services that these data could make possible. The report presents the results of a case study from Detroit, Michigan that evaluated the accuracy of on-board data elements as compared with data from conventional weather monitoring equipment. The report concludes with recommendations for future research.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://www.ops.fhwa.dot.gov/publications/viirpt/viirpt.pdf>
- HyperText Markup Language (HTML) format: <http://www.ops.fhwa.dot.gov/publications/viirpt/index.htm>

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- Walter Kulyk, FTA Office of Mobility Innovation, (202) 366-4991, Walter.Kulyk@dot.gov



Traffic Analysis Tools Section of the FHWA Office of Operations Website

This website is a compilation of resources related to traffic analysis tools. This website explains what traffic analysis tools are and what challenges these tools were designed to address, and recommends a process for identifying and organizing stakeholders. The website examines how traffic analysis tools can be used to plan for freeway management, traffic incident management, arterial management, work zone management, emergency management, travel demand management, and traveler information systems. The website contains information and updates on the FHWA Next Generation Simulation (NGSIM) Program. NGSIM Program materials include workshop proceedings, a summary of a simulation feasibility study, a summary of responses to a Request for Information (RFI) soliciting information on the program, a 19-slide presentation on the program, and a list of people who attended an information meeting on the program held in January 2001. The website also lists new features available with the latest version of one traffic analysis tool—Traffic Software Integrated System (TSIS) Version 5.0.

Cost: Free

To Access This Resource: Access the website address <http://ops.fhwa.dot.gov/trafficanalysisistools/index.htm>.



ITS Deployment Analysis System (IDAS)

The ITS Deployment Analysis System (IDAS) performs sketch planning analysis of ITS deployments. Planners and other transportation professionals can use IDAS to calculate relative costs and benefits of ITS investments, which are either alternatives to or enhancements of traditional highway and transit infrastructure investments. The current version of IDAS can predict relative costs and benefits of more than 60 types of ITS investments. For more information about IDAS, access the IDAS website at <http://idas.camsys.com>.

Cost: \$795

To Access This Resource: Order IDAS through the McTrans Center for Microcomputers in Transportation at the University of Florida, (352) 392-0378, fax: (352) 392-3224, mctrans@ce.ufl.edu, <http://mctrans.ce.ufl.edu>.



Traffic Software Integrated System (TSIS) 6.0

The Traffic Software Integrated System (TSIS) is a collection of software tools designed for use by traffic engineers and researchers. Originally built as a simple shell around the microscopic traffic simulation model CORridor SIMulation (CORSIM), TSIS has evolved into a sophisticated toolkit. CORSIM simulates traffic networks by moving individual vehicles across a combined surface street and freeway network. The TSIS package contains everything users need to perform traffic analyses through microscopic simulation: the TSIS application traffic tools, including CORSIM, sample projects, and documentation and support files.

Cost: \$1,000 for the complete package; \$500 for upgrades from older software packages.

To Access This Resource: Order TSIS through the McTrans Center for Microcomputers in Transportation at the University of Florida, (352) 392-0378, fax: (352) 392-3224, mctrans@ce.ufl.edu, <http://mctrans.ce.ufl.edu>.



Turbo Architecture Version 4.0

Turbo Architecture is an interactive software tool for regional and project-specific ITS architecture development. By helping the user integrate multiple project architectures with a regional architecture and with each other, Turbo Architecture makes it easier to develop an architecture consistent with the National ITS Architecture. Turbo Architecture Version 4.0 is compatible with the National ITS Architecture 6.0, has added new interfaces and flows, has updated equipment package descriptions, function requirements and ITS standards information, and is compatible with Microsoft Vista.

Cost: Free

To Access This Resource: Turbo Architecture Version 4.0 is available as part of the National ITS Architecture Version 6.0, in both CD-ROM and online formats. For the online version, access the website address <http://www.iteris.com/itsarch/html/turbo/turbomain.htm>. To order the National ITS Architecture Version 6.0 on CD-ROM, contact the Operations/ITS HelpLine, (866) 367-7487, itspubs@dot.gov.



QuickZone Version 2.0

QuickZone enables state and local traffic, construction, operations, and planning staff, and construction contractors to estimate traveler delay due to work zones. QuickZone was designed to be easy to learn and use and is suitable for both urban and interurban corridor analysis. QuickZone quantifies corridor delay resulting from capacity decreases in work zones, identifies delay impacts of alternative phasing programs, and supports trade-off analysis between construction costs and delay costs. QuickZone also enables users to consider alternative phasing schedules, assess the impacts of delay mitigation strategies, and calculate work completion incentives.

Cost: \$195

To Access This Resource: Order QuickZone through the McTrans Center for Microcomputers in Transportation at the University of Florida, (352) 392-0378, fax: (352) 392-3224, mctrans@ce.ufl.edu, <http://mctrans.ce.ufl.edu>.



CORSIM Traffic Simulation Model Training (NHI Course# 137022)

This seminar provides an understanding of CORridor SIMulation (CORSIM), a tool that simulates traffic and traffic control conditions on combined surface street and freeway networks. CORSIM determines how traffic engineering and control strategies impact a prescribed network's operational performance, as expressed in terms of various measures of effectiveness (MOEs). The MOEs, such as speed and delay, provide insights into the effects of the applied strategy on traffic operations and provide the basis for optimizing the applied strategy. Skill Level: Specialized learning. Target Audience: Traffic engineering technical staff from Federal, state, and local agencies. Course Length: Three days.

Cost: \$400 per participant. The sponsoring organization is responsible for providing 200 Mhz microcomputers with Windows 95 or Windows NT or better, color monitors, and a hard disk with 50 Mb free storage memory.

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137029A."



Turbo Architecture Software Training (NHI Course# 137029A)

This course provides training on how to use Turbo Architecture, which is a software tool for regional and project-specific architecture development. Target Audience: Public sector transportation professionals at the state, county, city, and metropolitan planning organization (MPO) levels, as well as private sector consultants, who are developing regional and project architectures. Skill Level: Specialized training. Course Length: Two days.

Cost: \$300 per participant. The sponsoring organization is responsible for providing 400 Mhz microcomputers running Windows SE or better, color monitors, and a hard disk with 50 Mb free storage memory.

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137029A."



Archived Data Points-of-Contact

- Ralph Gillmann, FHWA Office of Highway Policy Information, (202) 366-5042, Ralph.Gillmann@dot.gov
- Rich Taylor, FHWA Office of Transportation Management, (202) 366-1327, Rich.Taylor@dot.gov
- Larry Brown, FHWA Office of Safety, (202) 366-2214, LarryJ.Brown@dot.gov
- Michael Baltes, FTA Office of Mobility Innovation, (202) 366-2182, Michael.Baltes@dot.gov

<http://>

Archived Data User Service (ADUS) Website

This website is a compilation of resources related to the Archived Data User Service (ADUS) and archived data management systems (ADMSs). The website contains materials relating to ADUS program activities, ADUS standards, and other ADUS resources, as well as links to online data archives from Arizona, California, Maryland, Minnesota, Texas, Oregon, Virginia, and Washington State. The website is sponsored jointly by the ITS Joint Program Office and the FHWA Office of Highway Policy Information.

Cost: Free

To Access This Resource: : Access the website address <http://www.fhwa.dot.gov/policy/ohpi/travel/adus.htm>.

<http://>

Transportation Research Board Committee ABJ30 (formerly A1D08) on Urban Transportation Data and Information Systems

This site is the official website of the Transportation Research Board (TRB) Committee ABJ30 (formerly A1D08) on Urban Transportation Data and Information Systems. The site contains a listing of the committee chair, staff, and members; a discussion of the committee's mission and activities; meeting minutes; materials related to committee projects; and a summary of sessions sponsored by the committee at TRB Annual Meetings from 1997 to 2003. One of the subcommittees of ABJ30, co-sponsored with

the TRB Committee on Highway Traffic Monitoring (ABJ35), is the Archived Data User Service (ADUS) Joint Committee. This website contains selected materials related to the ADUS Joint Subcommittee.

Cost: Free

To Access This Resource: Access the website address <http://trb.mtc.ca.gov/urban>.



Archived Data Management System—Data Model

This software tool defines data requirements for an Archived Data Management System (ADMS), as defined in the National ITS Architecture. Definition of these requirements has been performed in order to more clearly define the key actors—i.e., entities that interact with the ADMS—and how these key actors would use the system. The ADMS Data Model includes a class diagram and sequence diagram for each of the three types of data interfaces: management of archive configuration, retrieval of data, and submittal of data. The ADMS Data Model also links to a white paper on the Rational Unified Process for software development, as well as allows the user to view ADMS system diagrams at two levels of analysis: the Use Case View and the Logical View. Finally, the tool links to a report upon which the information in the ADMS Data Model is based.

Cost: Free

To Access This Resource: Access the website address http://www.trevilon.com/adms_web_model/adms.html.



Presentations from the “Linking Archived Data User Services, Performance Measures, and Freeway Operations” Workshop (2007)

These presentations were given at a workshop on Linking Archived Data User Services, Performance Measures, and Freeway Operations that was held January 21, 2007 in Washington, D.C., in conjunction with the Transportation Research Board 86th Annual Meeting. The purpose of the workshop was to explore reasons why the freeway operations community has been reluctant to use archived traffic data to understand and manage the freeway

network. Possible reasons include inadequate software tools, lack of incentives to improve freeway management, cultural differences between planners and operators, inadequate training, and a high percentage of traffic detectors not working properly and the resulting data quality issues. The workshop's eight speakers were evenly divided into "tool builders" from the planning community and "skeptics" from freeway operations, in an attempt to reach an accord between these two culturally diverse groups.

Cost: Free

To Access This Resource: Access the website address <http://wiki.cecs.pdx.edu/bin/view/ItsWeb/ADUSWorkshop>.



Quality Control Procedures for Archived Operations Traffic Data: Synthesis of Practice and Recommendations (2007)

This report examines quality control (QC) procedures used in archived data management systems (ADMSs). Authors of the report studied nine data archives across the country to compare the criteria these archives use to determine the validity of traffic data. The report explains the difference between quality control and quality assurance (QA), with QC being one component of a comprehensive quality assurance program. The report concludes with recommended QC procedures to be used in data archives, including using validity criteria specified in the report, providing metadata to document QC procedures and results, and conducting manual and visual reviews of the data whenever feasible.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format:
http://www.fhwa.dot.gov/policy/ohpi/travel/qc/qc_procedures.pdf
- HyperText Markup Language (HTML) format:
<http://www.fhwa.dot.gov/policy/ohpi/travel/qc/index.htm>



Archived Data Management Systems: A Cross-Cutting Study (FHWA-JPO-05-044) (2005)

This report is one in a series designed to educate public sector managers about particular ITS technologies. Archived data management systems (ADMSs) use data generated by ITS technologies in transportation planning and operations. This report examines six ADMSs in depth, and discusses their design considerations, operational practices, benefits, and costs.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS HelpLine, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14128/14128.pdf
- HyperText Markup Language (HTML) format:
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14128.htm,
EDL# 14128.



National Evaluation of the TMC Applications of Archived Data Operational Test—ADMS Virginia (2005)

This report documents the findings of an operational test of the use of archived data to improve decision-making in the operation and management of a transportation network. The test took place in the Northern Virginia and Hampton Roads, Virginia metropolitan areas. The specific archived data management system (ADMS) evaluated in the test was the ADMS Virginia system developed by the Smart Travel Lab at the University of Virginia. The evaluation found that the ADMS Virginia system works well in the transportation operations and management environment. ADMS Virginia was found to overcome significant data quality challenges, experience a significant growth in usefulness when incorporating event data, but was hampered by the limited data surveillance available on the transportation network.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14250_files/14250.pdf
- HyperText Markup Language (HTML): http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14250.htm, EDL# 14250



Standard Practice for Metadata to Support Archived Data Management Systems (E2468-05) (2005)

This guide presents a hierarchical outline of sections and elements to be used in developing metadata to support archived data management systems. This guide establishes the names of metadata elements, as well as compound elements to be used in the metadata. The guide defines these metadata and compound elements and provides sample values for the metadata elements.

Cost: \$59

To Access This Resource: Order the Standard Guide for Archiving and Retrieving ITS-Generated Data through the American Society for Testing and Materials (ASTM) International, <http://www.astm.org> and search the Standards portion of the site for “E2468-05,” (610) 832-9585, service@astm.org.



Lessons Learned: Monitoring Highway Congestion and Reliability Using Archived Traffic Detector Data (2004)

This report summarizes lessons learned from the Mobility Monitoring Program regarding the use of archived traffic detector data for monitoring highway performance. The Mobility Monitoring Program started in 2000 with archived freeway detector data from 10 cities. By 2004, the program had grown to nearly 30 cities, covering about 3,000 miles of freeway. The lessons learned are centered in three general areas: analytical methods, data quality, and institutional issues.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/publications/lessons_learned/lessons_learned.pdf
- HyperText Markup Language (HTML) format: http://www.ops.fhwa.dot.gov/publications/lessons_learned/index.htm



Traffic Data Quality Measurement: Final Report (2004)

This report presents a framework for calculating data quality metrics for different applications. The framework is based on six recommended fundamental measures of traffic data quality: accuracy, completeness, validity, timeliness, coverage and accessibility. The report also presents guidelines and standards for calculating data quality measures, estimates the level-of-effort required of an agency to bring its data up to each standard, and presents recommended guidelines for data sharing agreements. Three case studies show how the traffic data quality metrics were applied to real-world data.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14058.htm, EDL# 14058.



Archived Data User Service (ADUS) ITS Standards Advisory (2003)

This flier is one of a series of documents that provide state and local transportation agencies with background and guidance on development issues and other key activities related to ITS standards. This flier describes the first ITS standard to be published related to the archived data user service (ADUS): *ASTM E2259-03 Standard Guide for Archiving and Retrieving ITS-Generated Data* issued by the American Society for Testing and Materials (ASTM). The flier contains case studies on the use of ASTM E2259-03 in Alaska, Arizona, Maryland, and Virginia; a list of contacts; and a bibliography.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.standards.its.dot.gov/Documents/advisories/adus_advisory.pdf
- HyperText Markup Language (HTML) format: http://www.standards.its.dot.gov/Documents/advisories/ADUS_Advisory.htm



Central Puget Sound Freeway Network Usage and Performance: 2001 Update (2003)

This report presents an overview of the level of traveler usage and travel performance on the principal urban freeways in the central Puget Sound area during 2001. The freeways included in this report are managed by the Washington State Department of Transportation through a coordinated network of traffic monitoring, measurement, information dissemination, and traffic control devices. This report is an example of how archived ITS data can be used to inform traffic operators, policymakers, and the general public.

Cost: Free

To Access This Resource: Access the website address <http://depts.washington.edu/trac/bulkdisk/pdf/563.1.pdf>.



Standard Guide for Archiving and Retrieving ITS-Generated Data (E2259-03a) (2003)

This guide covers desired approaches to be considered and followed in planning, developing, and operating specific archived data management systems (ADMSS) for the archived and retrieval of ITS-generated data.

Cost: \$47

To Access This Resource: Order the *Standard Guide for Archiving and Retrieving ITS-Generated Data* through the American Society for Testing and Materials (ASTM) International, <http://www.astm.org> and search the Standards portion of the site for "E2259-03a," (610) 832-9585, service@astm.org.



Traffic Data Quality Workshop Proceedings and Action Plan (2003)

This document presents a series of recommended steps to be taken by the U.S. DOT, stakeholder organizations, and state departments of transportation to improve the quality of traffic data. These recommendations were developed following development of a series of three white papers that explore issues and current practices for ensuring data quality, and hosting of two regional workshops in Columbus, Ohio, and Salt Lake City, Utah, on March 11, 2003, and March 13, 2003, respectively. This document provides proceedings of the workshops, as well as identifies 10 priority action items to be taken to improve traffic data quality nationwide.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13839.html, EDL# 13839.



Cross-Cutting Studies and State-of-the-Practice Reviews: Archive and Use of ITS-Generated Data (2002)

This report assesses the state-of-the-practice in generating, archiving, and using data generated by ITS technologies, identifies technological and institutional barriers and opportunities, and provides real-world examples of ITS-generated data being used for planning purposes. The assessments and analysis are centered on four major applications of archived data: operations and maintenance, planning, highway safety, and transit.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13697/13697.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13697.html, EDL# 13697



Archived Data User Service (ADUS) Survey of Emerging Sensor and Information Technologies (2001)

This report provides an overview of emerging technologies that collect, transport, store, and retrieve data generated by ITS systems, as well as emerging technologies for maintaining data quality, performing analysis, and dissemination of results. The report uses a graphical roadmap format to place each of these technologies in the context of a larger process of collecting, archiving, analyzing, and disseminating ITS data and information.

Cost: Free

To Access This Resource: Access the website address <http://www.noblis.org/Publications/2002-36.pdf>.



Proof of Concept of ITS as an Alternative Data Resource: A Demonstration Project of Florida and New York Data (2001)

This report demonstrates the feasibility of using ITS as an alternative method for collecting traffic data, specifically total traffic volume and total vehicle miles traveled. Traffic data collected from Florida and New York ITS deployments were used to test the feasibility of this concept. The report explores data quality issues, statistical procedures to identify and correct unacceptable data, aggregation, benefits, costs, and institutional challenges.

Cost: Free

To Access This Resource: Access the website address <http://www.ornl.gov/~webworks/cppr/y2001/rpt/112441.pdf>.



ITS Data Archiving: Five-Year Program Description (2000)

This document explains the need for and elements of a Federal program addressing the archiving and multi-agency use of data generated from ITS applications. This program plan spans from FY00 to FY05.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_pr/12583.pdf, EDL# 12583.



ITS Data Archiving Resources CD-ROM (2000)

This CD-ROM is a compilation of resources related to the Archived Data User Service (ADUS) and archived data management subsystems (ADMS). The CD-ROM contains reports, conference papers, conference presentations, and actual examples of data archives from Phoenix, Arizona; Atlanta, Georgia; San Antonio, Texas; Seattle, Washington; and the Oak Ridge National Laboratory. Featured reports include *ITS Data Archiving: Case Study Analyses of San Antonio TransGuide Data* and *Proceedings from the Texas ITS Data Uses and Archiving Workshop*.

Cost: Free

To Access This Resource: To order a copy of the CD-ROM, contact Shawn Turner, Texas Transportation Institute, (979) 845-8829, Shawn-Turner@tamu.edu.



Strategic Plan for the Development of ADUS Standards (2000)

This document outlines the standards needed for Archived Data User Service (ADUS) implementation and the critical paths that must be taken in order for those standards to be developed. The initial focus will be on ADUS standards that support highway performance monitoring.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_pr/12603.pdf, EDL# 12603.



What Have We Learned about Intelligent Transportation Systems? Chapter 7: What Have We Learned about Cross-Cutting Technical and Programmatic Issues? (2000)

This document is an excerpt from a compendium report that looks back on the 10 years of the National ITS Program to examine which ITS technology applications have been successful, which have not been successful, and what the underlying factors are that determine success versus failure. This section examines cross-cutting technologies for surveillance and communications, as well as programmatic issues, such as planning and analysis tools, archived data, standards, and architecture.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13323.pdf, EDL# 13323.



ITS Data Archiving: Case Study Analyses of San Antonio TransGuide Data (FHWA-PL-99-024) (1999)

This report documents the state-of-the-practice in retaining and using archived ITS data and provides lessons learned from a case study of archived data from the Texas Department of Transportation's TransGuide center in San Antonio. The state-of-the-practice review indicates that many transportation operations centers across the U.S. are becoming more interested in archiving ITS data. The case study focuses on issues of data aggregation and data quality.

Cost: Free

To Access This Resource: Access the website address <http://tti.tamu.edu/documents/FHWA-PL-99-024.pdf>.



Archived Data User Service (ADUS): An Addendum to the ITS Program Plan, Final Version 3.0 (1998)

This document provides a detailed description of the archived data user service (ADUS). This document serves as an addendum to the *National ITS Program Plan* in describing the 31st ITS user service and establishes the need for including data archiving in the National ITS Architecture.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_pr/5224.htm, EDL# 5224. This document is also included as an appendix in the *National Intelligent Transportation Systems Program Plan: Five-Year Horizon*.



Arterial Operations and Traffic Control Systems Points-of-Contact

- Brian Cronin, ITS Joint Program Office, (202) 366-8841, Brian.Cronin@dot.gov
- John Halkias, FHWA Office of Transportation Management, (202) 366-2183, John.Halkias@dot.gov
- Eddie Curtis, FHWA Office of Transportation Management, (404) 562-3920, Eddie.Curtis@dot.gov
- Neil Spiller, FHWA Office of Transportation Management, (202) 366-2188, Neil.Spiller@dot.gov
- Raj Ghaman, FHWA Office of Research, Development and Technology, (202) 493-3270, Raj.Ghaman@dot.gov
- Dave Gibson, FHWA Office of Research, Development and Technology, (202) 493-3271, David.Gibson@dot.gov
- Dale Thompson, FHWA Office of Research, Development and Technology, (202) 493-3420, Dale.Thompson@dot.gov
- Ed Fok, FHWA Resource Center, (415) 744-0113, Edward.Fok@dot.gov
- Walter Kulyk, FTA Office of Mobility Innovation, (202) 366-4991, Walter.Kulyk@dot.gov



Arterial Management Section of the FHWA Office of Operations Website

This website is a compilation of resources related to arterial systems management and traffic signal operations. The website reports on recent events plus contains a list of contacts and related links, including the Practitioner Toolbox. The Practitioner Toolbox website links to awareness and outreach materials, training courses, and reference documents related to arterial operations.

Cost: Free

To Access This Resource: Access the website address http://www.ops.fhwa.dot.gov/arterial_mgmt/index.htm.

http://

Access Management Section of the FHWA Office of Operations Website

This website is a compilation of resources related to access management, which is the proactive management of vehicular access points to land parcels. Access management techniques include access spacing, driveway spacing, safe turning lanes, median treatments, and right-of-way management. The website discusses what access management is, how it is achieved, what FHWA's role is, and what FHWA's measures of success are. The website lists technical assistance resources, such as publications, videos, and points-of-contact.

Cost: Free

To Access This Resource: Access the website address http://www.ops.fhwa.dot.gov/access_mgmt/index.htm.

http://

Intersections/Red Light Enforcement Camera Resources Section of the FHWA Office of Safety Website

This website is a compilation of resources related to red light camera (RLC) enforcement systems. The site contains an overview of RLC systems, a discussion of camera technology, and an annotated bibliography of important references, guidance documents, and technical reports. The site also contains points-of-contact and related links. Case studies from California, Maryland, Minnesota, New York, and Virginia show the safety benefits these local jurisdictions have experienced after deploying red light camera systems.

Cost: Free

To Access This Resource: Access the website address http://safety.fhwa.dot.gov/intersections/redl_cameras.htm.



Transportation Research Board Committee AHB70 (formerly ADA70) on Access Management Website

This site is the official website of the Transportation Research Board (TRB) Committee AHB70 (formerly ADA70) on Access Management. The site discusses what access management is, why it is important, and what the elements of a comprehensive access management program are. The website illustrates the 10 principles of access management in an interactive animated video. The website also contains a list of committee members, a schedule of upcoming access management-related events, and links to FHWA resources, state department of transportation access management websites, software developed under TRB sponsorship that calculates the impacts of access management techniques, and numerous publications. Documents accessible through Committee AHB70's website include TRB's *Access Management Manual*, access management guidelines and handbooks from states and local jurisdictions, state and local access management codes and regulations, proceedings of past conferences, and NCHRP reports.

Cost: Free

To Access This Resource: Access the website address <http://www.accessmanagement.info>.



ACS Lite

ACS Lite is a scaled-down version of the Adaptive Control Software (ACS) developed by FHWA and its partners in the early 2000s. ACS Lite has most of the functionality of ACS at a much lower cost. ACS Lite does not work on all traffic signal systems, only those operating under closed loop control, which describes 90% of the traffic signal systems in the U.S. Four manufacturers of traffic signal controllers have integrated ACS Lite to operate with their products; this integration has been validated by FHWA through field tests.

Cost: Variable, depending on vendor

To Access This Resource: Contact the following FHWA-approved vendors or FHWA staff:

- Eagle/Siemens: acslite@siemens.com
- Econolite: acslite@econolite.com
- McCain: acslite@maccaintraffic.com
- PEEK: acslite@quixotecorp.com
- Eddie Curtis, FHWA Office of Transportation Management, (404) 562-3920, Eddie.Curtis@dot.gov
- Raj Ghaman, FHWA Office of Operations Research and Development, (202) 493-3270, Raj.Ghaman@dot.gov



Traffic Software Integrated System (TSIS) 6.0

The Traffic Software Integrated System (TSIS) is a collection of software tools designed for use by traffic engineers and researchers. Originally built as a simple shell around the microscopic traffic simulation model CORridor SIMulation (CORSIM), TSIS has evolved into a sophisticated toolkit. CORSIM simulates traffic networks by moving individual vehicles across a combined surface street and freeway network. The TSIS package contains everything users need to perform traffic analyses through microscopic simulation: the TSIS application traffic tools, including CORSIM, sample projects, and documentation and support files.

Cost: \$1,000 for the complete package; \$500 for upgrades from older software packages.

To Access This Resource: Order TSIS through the McTrans Center for Microcomputers in Transportation at the University of Florida, (352) 392-0378, fax: (352) 392-3224, mctrans@ce.ufl.edu, <http://mctrans.ce.ufl.edu>.



Intelligent Transportation Systems for Traffic Signal Control: Deployment Benefits and Lessons Learned (FHWA-JPO-07-004) (2007)

This leaflet is one in a series that shows how ITS technologies, in support of the U.S. Department of Transportation's Congestion Initiative, can reduce congestion. This leaflet summarizes the benefits, costs, extent of deployment and lessons learned about the use of ITS for traffic signal control. The online version contains a full list of sources, so that all information in the leaflet's brief four pages is backed up with supporting documentation.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS Helpline, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.its.dot.gov/jpodocs/repts_te/14321_files/14321.pdf
- HyperText Markup Language (HTML) format: http://www.its.dot.gov/jpodocs/repts_te/14321.htm, EDL# 14321



Reduce Congestion with Access Management CD (FHWA-HEP-07-023) (2007)

The CD contains three key resources related to access management: a video and brochure, both titled *Safe Access is Good for Business*, and a summary report from a 2006 scanning tour of the U.S. on access management. The 12-minute video (FHWA-HEP-07-025) provides an overview of access management specifically targeted to address the concerns of business owners who fear that a change in street frontage will negatively affect his or her business. A 16-page brochure (FHWA-HOP-06-107) accompanies the video, providing additional detail, statistics and references, and acts as a take-home product to reinforce the message. The *Domestic Access Management Scan Tour: Summary Report* (FHWA-HEP-07-024) discusses how three local jurisdictions, one in Minnesota and two in Maine, conduct comprehensive transportation planning to achieve good access

management outcomes. The scan tour found that a major key to access with access management is a multidisciplinary, multi-jurisdictional approach that brings together engineering, planning, and land use.

Cost: Free

To Access This Resource: Contact the following FHWA staff:

- Neil Spiller, FHWA Office of Transportation Management, (202) 366-2188, Neil.Spiller@dot.gov
- Kathy Facer, FHWA Office of Planning, Environment and Realty, (785) 271-2448 x224, Kathy.Facer@dot.gov



Coordinated Freeway and Arterial Operations Handbook (FHWA-HRT-06-095) (2006)

This handbook provides direction, guidance, and recommendations on how to coordinate freeway and arterial operations in a proactive and comprehensive manner. The handbook defines coordinated freeway and arterial (CFA) operations and discusses how to apply CFA to four areas of high pay-off: traffic incident management, work zone management, planned special events management, and day-to-day (or recurring) operations. The handbook concludes with a discussion of new technologies such as ITS and an example of CFA in an incident management program in Northern Virginia. Development of this handbook was sponsored by the Transportation Management Center Pooled-Fund Study (TMC PFS).

Cost: Free

To Access This Resource: Access the website address

http://tmc pfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/06095.pdf.



Traffic Signal Preemption for Emergency Vehicles: A Cross-Cutting Study (FHWA-JPO-05-010) (2006)

This report is one in a series designed to educate public sector managers about particular ITS technologies. Emergency vehicle preemption (EVP) systems give emergency response vehicles a green light on their approach to a signalized intersection while

providing a red light to conflicting approaches. This report examines how transportation, police, fire/rescue and emergency medical services (EMS) officials in three local jurisdictions—Fairfax County, Virginia; Plano, Texas; and St. Paul, Minnesota—used EVP to improve emergency vehicle response time, improve safety, and lower costs. The report discusses who is using EVP nationwide and what the technology options, as well as benefits, costs and lessons learned are from their implementation.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS Helpline, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14097_files/14097.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14097.htm, EDL# 14097



Red Light Camera Systems Operational Guidelines (2005)

The purpose of these guidelines is to assist state and local jurisdictions that are considering the implementation of red light camera (RLC) enforcement systems. The guidelines cover problem identification, consideration of various safety countermeasures, RLC program initiation, system planning, engineering design, installation, operation, maintenance, and public information and education. Appendices provide an extensive list of references and a discussion of legal considerations.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://safety.fhwa.dot.gov/intersections/rlc_guide/rlcguide05jan.pdf
- HyperText Markup Language (HTML) format: http://safety.fhwa.dot.gov/intersections/rlc_guide/index.htm



Traffic Control Systems Handbook (FHWA-HOP-06-006) (2005)

This handbook serves as a basic reference for planning, designing, and implementing traffic control systems. The handbook presents a compendium of traffic control technology, including detectors, local controllers, communications equipment, traveler information systems, and overall systems control. The handbook provides advice on selection, design, implementation, and long-term management of a traffic control system by using the systems engineering (SE) concept of life-cycle processes. The handbook concludes with an overview of the ITS planning process at the national, regional, state, and agency levels. Last updated in 1996, the 2006 edition presents a more up-to-date compendium of technology, as well as a broader definition of traffic signal control that includes non-technological methods of achieving surface street traffic management. In addition, much of the material related to freeways in the 1996 edition was moved to the newly revised *Freeway Management and Operations Handbook*.

Cost: Free

To Access This Resource: Contact Eddie Curtis, FHWA Office of Transportation Operations, (404) 562-3920, Eddie.Curtis@dot.gov.



Transit Signal Priority: A Planning and Implementation Handbook (2005)

This handbook lays out the steps one should follow to implement a successful transit signal priority (TSP) project, including planning, design, implementation, operations, maintenance, evaluation, verification, and validation. The handbook uses eight in-depth case studies to communicate lessons learned in system architecture, equipment, software, communications, simulation, optimization, institutional issues, and public reaction to TSP. The case studies are presented in their entirety in the handbook's appendices, along with a list of resources and glossary of terms. This handbook was developed by the Intelligent Transportation Society of America (ITS America) with funding from the U.S. DOT.

Cost: Free

To Access This Resource: Access the website address <http://www.itsa.org/itsa/files/pdf/TSPHandbook2005.pdf>. To order a hardcopy, contact David Ridgley, ITS America, (202) 721-4228, DRidgley@itsa.org.



Access Management DVD Library (2004)

This DVD set contains a library with over 500 documents and videos related to access management, including past conference proceedings, conference presentations, and NCHRP reports related to access issues. The library has searchable indices in several formats, including Adobe Acrobat and MS Excel.

Cost: Free

To Access This Resource: Contact Neil Spiller, FHWA Office of Transportation Management, (202) 366-2188, Neil.Spiller@dot.gov.



Adaptive Control Software (FHWA-HRTS-04-037) (2004)

This brochure briefly presents the findings of a 10-year research effort at FHWA's Turner-Fairbank Highway Research Center (TFHRC) to develop several algorithms for adaptive traffic signal control. Project participants developed five initial prototype algorithms to address different geometric and traffic conditions. Three of the five were selected for field testing and further refinement. The brochure describes each of these three control strategies and the situations under which each is most appropriate for use. The brochure also describes the benefits, such as reduced travel time and reduced delay, experienced in field tests of the algorithms, as well as the estimated per-intersection cost of installation.

Cost: Free

To Access This Resource: Access the website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/publications/adaptivecontrol/acs_l2.pdf
- HyperText Markup Language (HTML) format: <http://www.ops.fhwa.dot.gov/publications/adaptivecontrolindex.htm>



An Overview of Transit Signal Priority (2004)

First published in 2002 and updated in 2004, this 27-page brochure provides an overview of transit signal priority (TSP). The brochure covers what TSP is, why it is important, what the costs and benefits are, how to plan for TSP deployment, and what issues to consider in the design, implementation, operations and maintenance of TSP. This brochure was developed by the Intelligent Transportation Society of America with funding from the U.S. DOT.

Cost: Free

To Access This Resource: Access the website address <http://www.itsa.org/itsa/files/pdf/FinalTSPOverviewUpdate.pdf>. To order a hardcopy, contact David Ridgley, ITS America, (202) 721-4228, DRidgley@itsa.org.



Telecommunications Handbook for Transportation Professionals: The Basics of Telecommunications (FHWA-HOP-04-034) (2004)

This handbook provides basic descriptions of terms and technologies that are commonly used (or considered) in the deployment of freeway management and traffic signal systems, including both voice and data communications. The handbook covers telecommunications fundamentals, the relationship between telecommunications and the National ITS Architecture, a step-by-step process for developing a telecommunications system, field devices, maintenance, warranties, and construction. The handbook also examines the Internet and cutting-edge technologies. Two case studies from Utah and Texas are provided.

Cost: Free

To Access This Resource: Access the website addresses:

- Adobe Acrobat format: http://ops.fhwa.dot.gov/publications/telecomm_handbook/telecomm_handbook.pdf
- HyperText Markup Language (HTML) format: http://ops.fhwa.dot.gov/publications/telecomm_handbook/index.htm



Access Management Manual (2003)

This manual provides technical information on access management techniques, along with information on how access management programs can be effectively developed and administered. The manual deals with the subject of access management in a comprehensive manner in an effort to integrate planning and engineering practices and the transportation and land use decisions that can improve access or make it worse. The manual draws upon the knowledge of experienced access management professionals to offer practical advice and lessons learned.

Cost: \$80 for the hardcopy version; \$60 for the CD-ROM version; \$100 for the hardcopy and CD-ROM set.

To Access This Resource: Contact the Transportation Research Board (TRB) Bookstore at <http://www.trb.org/bookstore> and search for "AMM03," (202) 334-3213, fax: (202) 334-2519.



Benefits of Access Management (FHWA-OP-03-066) (2003)

This brochure serves as a guide to the major benefits of access management, namely improved movement of through traffic, reduced crashes, and fewer vehicle conflicts. The brochure profiles the three most commonly used access management techniques: access spacing, turning lanes, and median treatments. The brochure notes that many businesses experience an increase in sales after implementation of access management techniques near their properties.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/access_mgmt/docs/benefits_am_trifold.pdf
- HyperText Markup Language (HTML) format: http://www.ops.fhwa.dot.gov/access_mgmt/docs/benefits_am_trifold.htm
- Contact Neil Spiller of the FHWA Office of Transportation Management, (202) 366-2188, Neil.Spiller@dot.gov



Signal Timing Process Final Report (2003)

Efforts to improve traffic signal timing operations have often focused on development and deployment of new timing plans. However, what was lacking in traffic signal timing literature was an examination of all the component procedures of the signal timing process: signal timing optimization, field deployment, performance evaluation, data management and documentation. This report addresses this discrepancy by examining the four component procedures of the traffic signal timing process, as well as interfaces between those procedures. The report describes signal timing processes and hardware commonly in use today. The report concludes with an evaluation of 12 research projects that could be undertaken at the national level to meet the needs of state and local agencies, three of which were found to have the highest potential for a nationwide improvement in traffic signal operations.

Cost: Free

To Access This Resource: Access the website address:

http://www.ops.fhwa.dot.gov/arterial_mgmt/rpt/sig_tim_proc/index.htm.



Unclogging Arterials: Prescriptions for Relieving Congestion and Improving Safety on Major Local Roadways (FHWA-OP-03-069) (2003)

This guidebook presents 15 strategies for increasing mobility and safety of travel on arterial streets. The guidebook also contains 10 case studies of local agencies that have employed these strategies, an action checklist, and appendices showing example documents, such as memoranda of understanding and city legislation, which readers can use as models in their own areas.

Cost: Free

To Access This Resource: Contact the Operations/ITS HelpLine, (866) 367-7487 or itspubs@its.dot.gov.



Cross-Jurisdictional Signal Coordination: Case Studies Final Report (FHWA-OP-02-034) (2002)

This report identifies five geographical areas that maintain cross-jurisdictional signal coordination. Each area has identified an approach that works well in its particular situation and demonstrates that cross-jurisdictional signal coordination is an achievable goal for any size community, regardless of the number of jurisdictions involved.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13613.html.



Successful Traffic Signal System Procurement Techniques: A Summary of Effective Processes (FHWA-OP-02-032) (2002)

Traffic signal systems are benefiting from the micro-computing and technology explosion of the past several decades. These new systems are more adaptable and more reliable than traffic signal systems of the past. However, these new technologies, and the capabilities enabled by them, introduce difficulties in procurement. Agencies are finding that these systems, equipment, and software do not meet their expectations for functionality and maintainability. In addition, it has become more difficult to manage the budget and schedule of a traffic signal system installation project. This document outlines a suggested procurement methodology that can support agencies in defining their signal systems needs and communicating those needs in a procurement.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13611.html.



Cross-Jurisdictional Signal Coordination in Phoenix and Seattle: Lessons Learned from the Metropolitan Model Deployment Initiative (FHWA-OP-01-035) (2001)

This is one in a series that documents lessons learned from the Metropolitan Model Deployment Initiative (MMDI). This report documents the benefits of integration between traffic signal controls across jurisdictional boundaries.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13222_files/13222.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13222.html, EDL# 13222.



San Antonio's Medical Center Corridor: Lessons Learned from the Metropolitan Model Deployment Initiative (FHWA-OP-01-034) (2001)

This is one in a series that documents lessons learned from the Metropolitan Model Deployment Initiative (MMDI). This report documents the benefits of integration of traffic management on both freeways and arterial streets.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13220.pdf.



What Have We Learned about Intelligent Transportation Systems? Chapter 3: Arterial Management (2000)

This document is an excerpt from a compendium report that looks back on the 10 years of the National ITS Program to examine which ITS technology applications have been successful, which have not been successful, and what the underlying factors are that determine success versus failure. This section examines

arterial management systems, such as adaptive traffic signal control, traveler information about conditions on arterial streets, automated red light running enforcement, and traffic signal preemption for emergency vehicles.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13319.pdf, EDL# 13319.



Enhancing Public Safety, Saving Lives— Emergency Vehicle Preemption (FHWA-JPO-99-002) (1999)

This brochure, one in a series designed to encourage decision-makers to invest their own budget resources in ITS, examines the public safety benefits of preemption of traffic signals for emergency vehicles such as fire trucks. The brochure quotes chiefs of transportation and fire departments in several cities around the country about the benefits they have experienced from using these systems.

Cost: Free

To Access This Resource: Access the website address <http://www.itsdocs.fhwa.dot.gov/jpodocs/brochure/6871.pdf>.



Manual of Traffic Signal Design, Second Edition (1998)

This manual covers the fundamentals of traffic signal design. The manual provides wiring and cabling specifications, shows readers how to prepare contractual documents, and discusses how to supervise construction of these systems. This second edition reflects changes in the warrants in the *Manual on Uniform Traffic Control Devices (MUTCD)*, National Electronic Manufacturers Association (NEMA) standards, and the *FHWA Federal Procedures Manual*.

Cost: \$75 for members of the Institute for Transportation Engineers (ITE); \$94 for non-members.

To Access This Resource: Contact the ITE Bookstore, <http://www.ite.org/bookstore/index.asp>, (202) 289-0222 x130, fax: (202) 289-7722, publications@ite.org.



Safe Access Is Good for Business (FHWA-HEP-07-025) (2006)

This 12-minute video provides an overview of access management specifically targeted to address the concerns of business owners who fear that a change in street frontage will negatively affect his or her business. The video discusses what access management is and the problems it is intended to solve. The video shows how improving the streetscape may actually improve business by alleviating traffic congestion, which many shoppers want to avoid. The video concludes with an explanation of the land use and transportation planning process and how business owners can get involved in local decision-making. A 16-page brochure (FHWA-HOP-06-107) accompanies the video, provides additional detail, statistics and references, and acts as a take-home product to reinforce the message.

Cost: Free

To Access This Resource: Access the following website addresses:

- Transportation Research Board Committee ADA70 on Access Management: <http://www.accessmanagement.info/AM2006/PrimerWeb.pdf>
- Access Management Section of the FHWA Office of Operations Website: http://www.ops.fhwa.dot.gov/access_mgmt/index.htm
- Contact Neil Spiller of the FHWA Office of Transportation Management, (202) 366-2188, Neil.Spiller@dot.gov



CORSIM Traffic Simulation Model Training (NHI Course# 137022)

This seminar provides an understanding of CORridor SIMulation (CORSIM), a tool that simulates traffic and traffic control conditions on combined surface street and freeway networks. CORSIM determines how traffic engineering and control strategies impact a prescribed network's operational performance, as expressed in terms of various measures of effectiveness (MOEs). The MOEs, such as speed and delay, provide insights into the effects of the applied strategy on traffic operations and provide the basis for optimizing the applied strategy. Skill Level: Specialized learning. Target Audience: Traffic engineering technical staff from Federal, state, and local agencies. Course Length: Three days.

Cost: \$400 per participant. The sponsoring organization is responsible for providing 200 Mhz microcomputers with Windows 95 or Windows NT or better, color monitors, and a hard disk with 50 Mb free storage memory.

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137022."



Traffic Signal Design and Operation (NHI Course# 133028)

This course addresses the application of the *Manual on Uniform Traffic Control Devices (MUTCD)* to intersection displays, as well as signal timing, computerized traffic signal systems, control strategies, integrated systems, traffic control simulation, and optimization software. Upon completion of this course, participants will gain an understanding of the congestion and delays that exist on streets and roadways and of how these delays can be managed through effective traffic signal timing and optimization. The course is divided into two parts: Traffic Signal Timing and Design, and Traffic Signal Systems. Skill Level: Specialized learning. Target Audience: Federal, state, and local traffic engineers involved in the design, review, and inspection of traffic control projects. Course Length: Two days.

Cost: \$300 per participant. The course fee includes a copy of the *Manual of Traffic Signal Design, Second Edition*.

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "133028."



Access Management, Location and Design (NHI# 133078)

This course presents the fundamentals of access management (AM) along highways and arterial streets. Topics covered in this course include the benefits of AM, AM practices and policies from various states and jurisdictions, warrants, design guidelines for the application of AM, retrofit programs, and evaluation of AM's impact on safety and operations. Target Audience: Engineers and planners at the Federal, state, and local levels who expect

to be involved in decisions about access to new or existing sites.
Course Length: Three days.

Cost: \$400 per participant. The course fee includes a copy of the Transportation Research Board's *Access Management Manual*.

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "133078."



Commercial Vehicle Operations Points-of-Contact

- Kate Hartman, ITS Joint Program Office, (202) 366-2742, Kate.Hartman@dot.gov
- Chris Flannigan, FMCSA Office of Analysis, Research and Technology, (202) 385-2384, Chris.Flannigan@dot.gov
- Amy Houser, FMCSA Office of Analysis, Research and Technology, (202) 385-2382, Amy.Houser@dot.gov
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- Julie Lane, FMCSA Office of Analysis, Research and Technology, (202) 385-2391, Julie.Lane@dot.gov
- Jeff Loftus, FMCSA Office of Analysis, Research and Technology, (202) 385-2363, Jeff.Loftus@dot.gov
- Jeff Secrist, FMCSA Office of Analysis, Research and Technology, (202) 385-2367, Jeff.Secrist@dot.gov

<http://>

FMCSA's Facts, Research and Technology Website

This website is a compilation of resources related to various aspects of commercial vehicle operations (CVO). The site contains CVO-related statistics; publications and reports; and a calendar of upcoming training, meetings, conferences, and other events. The website lists numerous documents about on-board safety and on-board security systems for commercial vehicles, including product guides and factors that should be considered in the decision to purchase these systems.

Cost: Free

To Access This Resource: Access the website address <https://www.fmcsa.dot.gov/facts-research/facts-research.htm>.

<http://>

FMCSA's Motor Carrier Security Website

This site is a compilation of resources developed to help law enforcement and commercial vehicle owners and operators to maintain motor carrier security, especially the secure shipment of hazardous materials (HAZMAT). Reference documents available

on the website include: a guide to developing a hazmat security plan, list of steps that should be taken by hazmat workers and companies in light of the current threat advisory level as determined by the Department of Homeland Security (DHS), anti-terrorism and anti-hijacking tips for hazmat drivers and companies, a flier issued by the Federal Bureau of Investigation (FBI) "If you receive a suspicious letter or package, what you should do," a checklist that law enforcement can use to perform a security assessment of a commercial vehicle operator, and a form to request free FMCSA training in motor carrier security risk assessment. The site also contains related links, including the National Hazardous Material Route Registry (NHMRR).

Cost: Free

To Access This Resource: Access the website address <http://www.fmcsa.dot.gov/safety-security/security/index.asp>.

http://

Product Guides for Safety and Security Systems Technology

This website contains product guides for several new technologies that can be used by commercial vehicles to improve their safety and security. Each product guide discusses what the technologies are, how they can be used in a commercial vehicle operating environment, and their benefits and costs. Each product guide also lists contact information of vendors that sell the particular technology. A companion website <https://www.fmcsa.dot.gov/facts-research/systems-technology/decision-factors/decisionfactors.htm> lists factors that should be considered when deciding to make, use or buy technologies in the commercial motor vehicle industry.

Cost: Free

To Access This Resource: Access the website address <https://www.fmcsa.dot.gov/facts-research/systems-technology/product-guides/productguides.htm>.



Development and Evaluation of Alternative Concepts for Wireless Roadside Truck and Bus Safety Inspections (FMCSA-RRT-07-005) (2007)

This report presents a concept of operations that links advanced on-board vehicle and driver monitoring technologies with a means of wirelessly communicating such information to local enforcement agencies in order to create virtual, automated, wireless inspections. These inspections could be used to pre-screen vehicles which should be selected for labor-intensive manual inspections, thus reducing inconvenience to drivers and carriers with good records and concentrating scarce resources where they are most needed. Virtual inspections could be accomplished based on data that already exist on the vehicle, i.e., data related to brakes, tires, lights, hours-of-service (HOS), commercial driver's license (CDL) status, carrier identity and vehicle information number (VIN). This information could be broadcast to virtual inspection systems using the vehicle's own communications equipment and combined with the Motor Carrier Management Information System (MCMIS) and commercial vehicle databases of individual states.

Cost: Free

To Access This Resource: Access the website address <https://www.fmcsa.dot.gov/facts-research/research-technology/report/wireless-inspection-report.pdf>.



Expanded Satellite-Based Mobile Communications Tracking System: Final Report (2007)

This report documents the findings of a pilot test of a wireless, satellite-based mobile communications tracking system that monitors the movement of hazardous materials (HAZMATs). The three-month test was conducted in Alaska and Hawaii because satellite-based tracking services are only partially available in certain regions of these states. The system was tested on 100 trucks from four HAZMAT carriers in Alaska and five trucks from a single HAZMAT carrier in Hawaii. Information on location of

the trucks was used by three technology applications: driver-to-dispatcher communications, panic buttons, and tethered trailer tracking. The safety and security of the HAZMAT shipments were assessed both with and without these applications. The satellite-based tracking system was able to determine the position of the truck 84% of the time in the Alaska test and 99% of the time in the Hawaii test. Despite occasional gaps in coverage, the three applications tested had positive effects on both the safety and security of HAZMAT shipments.

Cost: Free

To Access This Resource: Access the website address <https://www.fmcsa.dot.gov/facts-research/research-technology/report/Expanded-Satellite-based-Mobile-Communications-Tracking-System-Final-Report-June2007.pdf>.



Testing and Assessment of J1939 Network Model (FMCSA-PSV-07-003) (2007)

This report documents the findings of a laboratory test of the J1939 communications standard. J1939 is a worldwide standard established by the Society for Automotive Engineers (SAE) for data communication on trucks, buses, off-road construction vehicles, and marine vessels. This standard enables multiple software systems to operate on the same vehicle and to resolve conflicts in a way that best maintains safety. With innovations in on-board vehicle technology, the number of possible systems using the J1939 standard on a single vehicle continues to increase. A hardware-in-the-loop (HIL) simulator was constructed to test whether the J1939 standard could accommodate the level of data transmission published in the standard. In particular, the study sought to determine whether the addition of non-safety-critical systems would compromise safety-critical systems. The study found that the standard appears to have 2.5 to 3 times the capacity currently used by the majority of commercial heavy vehicles today. This capacity should allow for the addition of new systems, such as electronic stability control, roll stability control, and wireless vehicle inspection systems.

Cost: Free

To Access This Resource: Access the following website addresses:

- Full report: <https://www.fmcsa.dot.gov/facts-research/research-technology/report/Testing-and-Assessment-of-a-Full-Scale-J1939-Network-Model/J1939-Final-Report.pdf>
- Tech Brief (FMCSA-PSV-07-004) (2007)—Adobe Acrobat format: <https://www.fmcsa.dot.gov/facts-research/research-technology/tech/J1939-Network-Testing-march-2007.pdf>
- Tech Brief—HyperText Markup Language (HTML) format: <https://www.fmcsa.dot.gov/facts-research/research-technology/tech/J1939-Network-Testing-march-2007.htm>



Tire Pressure Monitoring and Maintenance Systems Performance Report (FMCSA-PSV-07-001) (2007)

This report documents the findings of a test of tire pressure monitoring and maintenance systems (TPMSs). These systems have the potential to achieve significant advances in safety because they automate functions—monitoring and maintenance of tire pressure—that are both critical to commercial vehicle safety but also inconvenient, time-consuming and often neglected. Three types of TPMSs were evaluated: dual tire equalizers that balance pressure between a pair of tires, tire pressure monitors that sound an alarm when the pressure goes outside safe levels, and central inflation systems (CISs) that actually alter the tire pressure to achieve a safe level. Two dual inflation systems, five tire pressure monitoring systems and two CISs were evaluated under controlled conditions on a test track at the Transportation Research Center (TRC) in Columbus, Ohio. The study found that all products tested generally performed as designed and specified by their manufacturers. However, the study revealed nuances in performance that commercial vehicle fleets can use to determine which system best fits their needs.

Cost: Free

To Access This Resource: Access the website address <https://www.fmcsa.dot.gov/facts-research/research-technology/report/Tire-Pressure-Monitoring-Jan07.pdf>.



Evaluation of the Mack Intelligent Vehicle Initiative Field Operational Test: Final Report (FMCSA-06-016) (2006)

This report documents the findings of a field test of the SAFETrac lane departure warning system (LDWS). The SAFETrac system was installed on 22 Mack trucks driven by 31 drivers based in 10 terminals throughout the southeastern U.S. The one-year field test evaluated the system in terms of safety benefits, driver acceptance, performance and capability potential, and benefit-cost analysis. The evaluation found that the deployment of the LDWS would result in a 21 to 23 percent reduction in single vehicle roadway departure crashes, that a majority of drivers felt the system increased their lane-keeping ability, and that the system would be cost-beneficial for certain types of trucks: tanker-trailers and hazardous materials (HAZMAT) tankers.

Cost: Free

To Access This Resource: Access the following website address <https://www.fmcsa.dot.gov/facts-research/research-technology/report/Evaluation-of-the-Mack-Intelligent-Vehicle-Field-Operational-Test-Sep2006.pdf>.



Concept of Operations and Voluntary Operational Requirements On-Board Commercial Motor Vehicles (2005)

This series of reports describe the concept of operations and voluntary requirements for four types of technologies for large trucks greater than 10,000 pounds gross vehicle weight rating (GVWR). The types of technologies are Forward Collision Warning Systems (FCWS), Automated Cruise Control/Collision Warning Systems (ACC/CWS), Lane Departure Warning Systems (LDWS), and Vehicular Stability Systems (VSS). Concepts of operations provide information about how each user interacts with these safety systems and their operational conditions. Voluntary requirements describe features and functions used to define the safety systems and their operational functionality.

Cost: Free

To Access This Resource: Access the following website addresses:

- Forward Collision Warning Systems and Automated Cruise Control/Collision Warning Systems (FMCSA-MCRR-05-007)—Adobe Acrobat format: <http://www.fmcsa.dot.gov/facts-research/research-technology/report/forward-collision-warning-systems.pdf>
- Forward Collision Warning Systems and Automated Cruise Control/Collision Warning Systems—HyperText Markup Language (HTML) format: <http://www.fmcsa.dot.gov/facts-research/research-technology/report/forward-collision-warning-systems>.
- Lane Departure Warning Systems (FMCSA-MCRR-05-005)—Adobe Acrobat format: <http://www.fmcsa.dot.gov/facts-research/research-technology/report/lane-departure-warning-systems.pdf>
- Lane Departure Warning Systems—HyperText Markup Language format: <http://www.fmcsa.dot.gov/facts-research/research-technology/report/lane-departure-warning-systems.htm>
- Vehicular Stability Systems (FMCSA-MCRR-05-006)—Adobe Acrobat format: <http://www.fmcsa.dot.gov/facts-research/research-technology/report/vehicular-stability-systems.pdf>
- Vehicular Stability Systems—HyperText Markup Language format: <http://www.fmcsa.dot.gov/facts-research/research-technology/report/vehicular-stability-systems.htm>



Deployment of On-Board Safety Systems (2005)

This brochure gives an overview of several on-board technologies that have the potential to dramatically increase the safety of commercial vehicles. The brochure profiles technologies, currently in development, that aim to reduce truck rollovers, rear-end collisions, and lane departure crashes, including systems for roll stability advisories (RSA), roll stability control (RSC), electronic stability control (ESC), forward collision warning (FCW), adaptive cruise control (ACC), and lane departure warning (LDW).

Cost: Free

To Access This Resource: To order a hardcopy, contact Amy Houser, FMCSA Office of Analysis, Research and Technology, (202) 385-2382, Amy.Houser@dot.gov.



Driver Violation Notification Service Feasibility Study (FMCSA-MCRR-05-003) (2005)

This report documents the findings of an assessment of the safety benefits of driver violation notification programs (also known as Employee Pull Notice or Driver Pull Notice programs). In these programs, states automatically notify motor carriers of changes in their drivers' Commercial Driver's License (CDL) records due to violations and convictions. The project team analyzed programs in 10 states and surveyed several motor carriers in order to both determine how well these programs work and establish requirements for an expanded nationwide program.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://www.fmcsa.dot.gov/facts-research/research-technology/report/dvn-finalreport.pdf>
- HyperText Markup Language (HTML) format: <http://www.fmcsa.dot.gov/facts-research/research-technology/report/dvn-finalreport.htm>



Factors in Decisions to Make, Purchase, and Use On-Board Safety Technologies (FMCSA-MCRT-06-003) (2005)

This report documents the findings of a study of what motivates key commercial vehicle stakeholders when making decisions to manufacture, buy, or use on-board safety technologies. Telephone interviews were conducted with several individuals representing a wide range of stakeholders: 19 motor carriers, five insurance companies, two associations, one driver training program. Factors identified in making manufacturing, purchase, and use decisions include return on investment, demonstrated effectiveness

to improve safety, reliability, maintainability, liability, market demand, initial cost, market image, driver acceptance, and ease of integrating the new technology into the existing layout of the commercial vehicle cab.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://www.fmcsa.dot.gov/facts-research/research-technology/report/factors-in-decisions.pdf>
- HyperText Markup Language (HTML) format: <http://www.fmcsa.dot.gov/facts-research/research-technology/report/factors-in-decisions.htm>



Hazardous Materials Serious Crash Analysis: Phase 2 Final Report (2005)

This report presents a process for populating the Hazardous Materials (HAZMAT) Accidents Database based on analysis of crash records from the Motor Carrier Management Information System (MCMIS). This process results in a HAZMAT Accidents Database that identifies more crashes as serious HAZMAT crashes and contains more data about each crash. A more data-rich HAZMAT Accidents Database better enables analysis of causes and effects of serious HAZMAT crashes and leads to increased support for the development and evaluation of safety countermeasures and risk reduction techniques.

Cost: Free

To Access This Resource: Access the website address <https://www.fmcsa.dot.gov/facts-research/research-technology/report/Hazardous-Materials-Serious-Crash-Analysis-Phase2-April2005.pdf>.



Intelligent Transportation Systems and Truck Parking (FMCSA-MCRR-05-001) (2005)

This report discusses key issues concerning deployment of technologies that convey real-time information on parking availability for truckers on the road. The report addresses the

following questions: Is there a shortage of parking? Is the truck parking shortage likely to worsen? What are potential solutions? What can be done to better match supply and demand?

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://www.fmcsa.dot.gov/facts-research/research-technology/report/intelligent-transportation-truckparking.pdf>
- HyperText Markup Language (HTML) format: <http://www.fmcsa.dot.gov/facts-research/research-technology/report/intelligent-transportation-truckparking.htm>



On-Board Sensors for Determining Brake System Performance (2003-2005)

This report documents the performance and operational characteristics of several cutting-edge technological approaches to monitoring commercial vehicle braking systems. Some of the systems evaluated are commercially available and others are still in development. These systems have three primary applications, all with the potential to significantly improve commercial vehicle safety: warning drivers and maintenance personnel when braking ability has degraded to an unsafe level, providing brake status information to public safety personnel during roadside inspections, and integrating brake status information into electronically controlled braking systems (ECBSs). Four types of systems were evaluated under controlled conditions on a test track at the Transportation Research Center (TRC) in Columbus, Ohio: anchor pin strain gauges, stroke sensors, wheel-speed sensors, and brake shoe thermocouples. The study found that anchor pins, commercial brake chamber stroke sensors and wheel-speed sensors can detect most brake deficiencies, but that the response time of thermocouples is not sufficient to detect brake problems during singular, discrete braking events. An accompanying User's Guide shows the reader how to use the software developed to analyze the data generated during the test.

Cost: Free

To Access This Resource: Access the following website addresses:

- Report (2003): <https://www.fmcsa.dot.gov/facts-research/research-technology/report/On-board-Sensors-For-Determining-Brake-System-Performance-Report.pdf>
- User's Guide (2005): <https://www.fmcsa.dot.gov/facts-research/research-technology/report/User-Guide-for-Brake-Sensor-Report.pdf>



Untethered Trailer Tracking (UTT) and Control System (FMCSA-MCRRT-06-002) (2005)

This report documents the findings of a pilot test of an untethered trailer tracking (UTT) system, the purpose of which was to improve the safety and security of trailers and shipments at each phase of goods movement. The UTT system tested in this pilot project include near-real-time trailer identification, accurate time-of-connection and time-of-disconnection activities, location and mapping of trailers, "geo-fencing" to identify a risk area or unscheduled trailer movement, remote sensing of a loaded or empty trailer, and security of the cargo floor. The UTT equipment was installed on 75 trailers, each running one of three operational scenarios. The UTT system was tested over a three-month period from October 2004 to January 2005. This report presents an assessment of the functionality of the UTT system and potential improvements in security, safety and efficiency that can be gained from its use. The operational requirements document, available online at <http://www.fmcsa.dot.gov/facts-research/research-technology/report/untethered/untethered-trailer-tracking.htm>, outlines the requirements for these systems, provides a detailed breakdown of the individual technologies used, and outlines how these requirements can be met under the three operational scenarios used in the pilot test.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://www.fmcsa.dot.gov/facts-research/research-technology/report/untethered-dec05/untethered-dec05.pdf>
- HyperText Markup Language (HTML) format: <http://www.fmcsa.dot.gov/facts-research/research-technology/report/untethered-dec05/index.htm>



The Evaluation of Advanced Traveler Information Services (ATIS) Impacts on Truck Travel Time Reliability (2004)

This report evaluates the ability of advanced traveler information systems (ATIS) to improve the on-time reliability of commercial vehicles in an urban setting. The evaluation uses the Heuristic On-Line Web-Linked Arrival Time Estimation (HOWLATE) simulation model to evaluate the impacts of ATIS on freight movements at an international terminal in Los Angeles, California. The study provides dollar value estimates of the benefits of ATIS and concludes that for commercial vehicle operators with stringent on-time requirements who face considerable travel time variability ATIS is a useful and high-value service.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13988_files/13988.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13988.html, EDL# 13988



Effective Commercial Truck and Bus Safety Management Techniques (CTBSSP Synthesis# 1) (2003)

This report documents the findings of a survey among safety managers at commercial motor vehicle (CMV) fleets and other experts in commercial motor vehicle safety. Survey respondents

were asked to prioritize the most important safety problems (such as aggressive driving, driver fatigue, and a lack of defensive driving skills among some drivers), as well as the most effective techniques for addressing these problems (such as using strict hiring criteria, offering standardized training to all drivers, and continuous tracking of drivers' safety records). A common theme that emerged from the survey was that motor carrier safety management should be elevated to a mature science that conducts research into risk factors and develops and evaluates appropriate safety countermeasures.

Cost: \$17 for the hardcopy; the online version is free.

To Access This Resource: To order the hardcopy, contact the Transportation Research Board (TRB) Bookstore at <http://www.trb.org/bookstore> and search for "CTBS01," (202) 334-3213, Fax: (202) 334-2519. For the online version, access the following website addresses:

- Front cover, Foreword, Table of Contents and Executive Summary: http://onlinepubs.trb.org/onlinepubs/ctbssp/ctbssp_syn1fm.pdf
- Chapter 1: http://onlinepubs.trb.org/onlinepubs/ctbssp/ctbssp_syn1c1.pdf
- Chapter 2: http://onlinepubs.trb.org/onlinepubs/ctbssp/ctbssp_syn1c2.pdf
- Chapter 3: http://onlinepubs.trb.org/onlinepubs/ctbssp/ctbssp_syn1c3.pdf
- Chapter 4: http://onlinepubs.trb.org/onlinepubs/ctbssp/ctbssp_syn1c4.pdf
- Chapter 5: http://onlinepubs.trb.org/onlinepubs/ctbssp/ctbssp_syn1c5.pdf
- References: http://onlinepubs.trb.org/onlinepubs/ctbssp/ctbssp_syn1ref.pdf
- Appendices A and B: http://onlinepubs.trb.org/onlinepubs/ctbssp/ctbssp_syn1aAB.pdf
- Appendix C: http://onlinepubs.trb.org/onlinepubs/ctbssp/ctbssp_syn1aC.pdf
- Appendix D: http://onlinepubs.trb.org/onlinepubs/ctbssp/ctbssp_syn1aD.pdf

- Appendix E: http://onlinepubs.trb.org/onlinepubs/ctbssp/ctbssp_syn1aE.pdf
- FMCSA Tech Brief (FMCSA-MCRRR-07-006):
<https://www.fmcsa.dot.gov/facts-research/research-technology/tech/Truck-and-Bus-Safety-Management-feb-2007.pdf>



Introduction to ITS/CVO and CVISN (CVISN 101)

This Web-based course provides an introduction to the ITS/CVO program and the Commercial Vehicle Information Systems and Networks (CVISN) initiative. The course includes a short discussion of some of the problems currently existing in CVO and an overview of the four main areas of the ITS/CVO program: Safety Assurance, Credentials Administration, Electronic Screening, and Carrier Operations. The concepts underlying current and future strategies are described for each of these areas, as well as the technologies used to carry them out. The discussion of CVISN focuses on the Level 1 capabilities (Safety Information Exchange, Electronic Credentialing, and Electronic Screening) and the deployment process developed for their implementation. Target Audience: Public sector transportation professionals including Federal engineers, planners, project managers, and field staff and others as appropriate. Transportation professionals from state, regional, and local agencies would also benefit from participation in the course. A blended Web-based version provides online interaction between participants and instructors. Course Length: Six hours.

Cost: \$150 per participant for the Web-based version; \$175 per participant for the blended version.

To Access This Resource:

- Access the website address
<http://www.citeconsortium.org/courses/2mod3.html>.
- Contact Julie Lane, FMCSA Office of Analysis, Research and Technology, (202) 385-2391, Julie.Lane@dot.gov or Carolyn Temperine, FMCSA Eastern Service Center, (518) 431-4239 x270, Carolyn.Temperine@dot.gov.



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- Neil Spiller, FHWA Office of Transportation Management, (202) 366-2188, Neil.Spiller@dot.gov
- Jessie Yung, FHWA Office of Transportation Management, (202) 366-4672, Jessie.Yung@dot.gov
- Dale Thompson, FHWA Office of Research, Development and Technology, (202) 493-3420, Dale.Thompson@dot.gov
- Greg Jones, FHWA Resource Center, (404) 562-3906, GregM.Jones@dot.gov



Freeway Management Program Section of the FHWA Office of Operations Website

This website is a compilation of resources related to highway operations and freeway management systems. The website explains what freeway management systems are, why they are important, and links to the website profiling the *Freeway Management Handbook*.

Cost: Free

To Access This Resource: Access the website address <http://www.ops.fhwa.dot.gov/freewaymgmt/index.htm>.



Traffic Bottlenecks Section of the FHWA Office of Operations Website

This website is a compilation of resources related to traffic bottlenecks, i.e., “small corridors of delay” where there is congestion upstream and free flow downstream. The website discusses the definition of a bottleneck area, common causes of bottlenecks, their role in the growing congestion problem, and successful mitigation strategies. The website defines freight bottlenecks and discusses how they are different from

bottlenecks that cause congestion among the general population of vehicles. The website contains a link to the document *Traffic Bottlenecks: A Primer—Focus on Low-Cost Operational Improvements*, a table showing the differences between recurring and non-recurring bottlenecks, and case studies on how state and local agencies have successfully reduced congestion at bottleneck sites. The website was developed as part of FHWA's Localized Bottleneck Reduction (LBR) Program.

Cost: Free

To Access This Resource: Access the website address

<http://www.ops.fhwa.dot.gov/publications/bnprimer/index.htm>.

[http://](#)

Transportation Research Board Committee AHB20 (formerly A3A09) on Freeway Operations Website

This site is the official website of the Transportation Research Board Committee AHB20 (formerly A3A09) on Freeway Operations. The site contains the committee's mission statement, a list of current projects and their status, membership list, papers and award nominations to be reviewed by committee members, other reference documents pertaining to the committee, and related links.

Cost: Free

To Access This Resource: Access the website address

<http://www.trb-freewayops.org>.

[http://](#)

Vehicle Detector Clearinghouse Website

This site is the official website of the Vehicle Detector Clearinghouse (VDC), a Pooled-Fund Study among several states in cooperation with the Federal Highway Administration. The mission of the VDC is to provide information to transportation agencies about the capabilities of commercially available vehicle detectors. Equipment types studied by the VDC are devices that detect vehicle presence, speed, axles, classification (automated vehicle classification [AVC]), and weight (weigh-in-motion [WIM]). The clearinghouse also seeks to be a catalyst for developing standard protocols for testing equipment. The

site contains a database of vehicle detection products as well as results of a survey of which state departments of transportation are using which products. The site also contains materials related to past and upcoming meetings, an online version of the VDC Newsletter, an extensive list of reference documents with abstracts available online, a nationwide list of contacts, and related links.

Cost: Free

To Access This Resource: Access the website address <http://www.nmsu.edu/~traffic>.



Traffic Bottlenecks: A Primer—Focus on Low-Cost Operational Improvements (FHWA-HOP-07-013) (2007)

This primer discusses bottleneck areas in the transportation network: the definition of a bottleneck area, common causes of bottlenecks, and their role in the growing congestion problem. The primer presents 12 short-term, low-cost mitigation strategies and assesses each strategy's effectiveness at improving bottlenecks caused by various factors, such as lane drops, narrow weaving areas, and long climbs. The primer summarizes the results of a survey of state and local agencies conducted as part of an NCHRP study as to the most commonly used mitigation strategies. The primer concludes with brief case studies from Florida, Georgia, Maryland, Texas, and Washington State on how state and local agencies have successfully reduced congestion at bottleneck sites. The primer was produced as part of FHWA's Localized Bottleneck Reduction (LBR) Program.

Cost: Free

To Access This Resource: To order a hardcopy, contact Neil Spiller of the FHWA Office of Transportation Management, (202) 366-2188, Neil.Spiller@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/publications/bnprimer/bottleneck_jul07.pdf
- HyperText Markup Language (HTML) format: <http://www.ops.fhwa.dot.gov/publications/bnprimer/index.htm>



Coordinated Freeway and Arterial Operations Handbook (FHWA-HRT-06-095) (2006)

This handbook provides direction, guidance and recommendations on how to coordinate freeway and arterial operations in a proactive and comprehensive manner. The handbook defines coordinated freeway and arterial (CFA) operations and discusses how to apply CFA to four areas of high pay-off: traffic incident management, work zone management, planned special events management, and day-to-day (or recurring) operations. The handbook concludes with a discussion of new technologies such as ITS and an example of CFA in an incident management program in Northern Virginia. Development of this handbook was sponsored by the Transportation Management Center Pooled-Fund Study (TMC PFS).

Cost: Free

To Access This Resource: Access the website address http://tmc pfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/06095.pdf.



Ramp Management and Control Handbook (2006)

This handbook provides guidance and recommended practices on managing and controlling traffic on ramps with freeway facilities. The handbook discusses several ramp management strategies, including how to select appropriate strategies and develop ramp management plans, how to implement those strategies and plans, how to operate and maintain these strategies, and how to assess their performance and report on the results. This handbook also describes in greater depth the issues and concepts specific to ramp management and control presented in Chapter 7 of the *Freeway Management and Operations Handbook*. In addition to the *Ramp Management and Control Handbook*, key concepts of ramp management and control are summarized in a primer, brochure, fact sheet, and frequently asked questions (FAQ) document. Development of these materials was sponsored by the Transportation Management Center Pooled-Fund Study (TMC PFS).

Cost: Free

To Access This Resource: Access the following website addresses:

- Handbook (FHWA-HOP-06-001)—Adobe Acrobat format:
http://ops.fhwa.dot.gov/publications/ramp_mgmt_handbook/manual/manual/pdf/rm_handbook.pdf
- Handbook—HyperText Markup Language (HTML):
http://ops.fhwa.dot.gov/publications/ramp_mgmt_handbook/manual/manual/default.htm, EDL# 14242
- Primer (FHWA-HOP-06-080)—Adobe Acrobat format:
http://ops.fhwa.dot.gov/publications/ramp_mgmt_handbook/primer/rm_primer.pdf
- Primer—HyperText Markup Language format:
http://ops.fhwa.dot.gov/publications/ramp_mgmt_handbook/primer/primer.htm
- Brochure (FHWA-HOP-06-082)—Adobe Acrobat format:
http://ops.fhwa.dot.gov/publications/ramp_mgmt_handbook/brochure/rm_brochure.pdf
- Brochure—HyperText Markup Language format:
http://ops.fhwa.dot.gov/publications/ramp_mgmt_handbook/brochure/brochure.htm
- Project Fact Sheet (FHWA-HOP-06-082)—Adobe Acrobat format: http://ops.fhwa.dot.gov/publications/ramp_mgmt_handbook/factsheet/rm_fact_sheet.pdf
- Project Fact Sheet—HyperText Markup Language format:
http://ops.fhwa.dot.gov/publications/ramp_mgmt_handbook/factsheet/factsheet.htm
- Questions and Answers (FHWA-HOP-06-083)—Adobe Acrobat format: http://ops.fhwa.dot.gov/publications/ramp_mgmt_handbook/faqs/rm_faqs.pdf
- Questions and Answers—HyperText Markup Language format: http://ops.fhwa.dot.gov/publications/ramp_mgmt_handbook/faqs/ramp_faqs.htm



Changeable Message Sign Operation and Messaging Handbook (FHWA-OP-03-070) (2004)

This handbook is a consolidation of the most current and best information on the design and display of effective changeable message sign (CMS) messages for incident and roadwork events. The handbook presents this information in a series of 10 modules covering topics such as fundamentals of CMS operations, CMS operating policies, principles of CMS message design, dealing with long messages, establishing a maximum message length, formatting messages, and the CMS message design process. The handbook is designed to help both new and experienced users of CMSs at various levels of a given agency. Development of this handbook was sponsored by the Transportation Management Center Pooled-Fund Study (TMC PFS).

Cost: Free

To Access This Resource: Access the website address http://tmc pfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/CMS%20Operation%20and%20Messaging%20Handbook-Final%20Draft.pdf.



Managed Lanes: A Cross-Cutting Study (FHWA-HOP-05-037) (2004)

This report reviews the state-of-the-art in managed lanes, i.e., employing various strategies—such as high-occupancy vehicle (HOV) lanes, high-occupancy toll (HOT) lanes, value pricing, and special use lanes—to improve traffic flow and maximize the efficiency of the freeway system. This report explores what managed lanes are, how to plan for their implementation, what operational and design issues should be considered, and how active management of the lanes over the life of the facility affects implementation. The report presents several case studies which highlight best practices and lessons learned. Finally, the report discusses emerging issues, knowledge gaps, and directions for further research.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/freewaymgmt/publications/managed_lanes/crosscuttingstudy/final3_05.pdf
- HyperText Markup Language (HTML) format: http://www.ops.fhwa.dot.gov/freewaymgmt/publications/managed_lanes/crosscuttingstudy/index.htm



Managed Lanes: A Primer (FHWA-HOP-05-031) (2004)

This 24-page brochure serves as a primer on managed lanes, i.e., employing various strategies—such as high-occupancy vehicle (HOV) lanes, high-occupancy toll (HOT) lanes, value pricing, and special use lanes—to improve traffic flow and maximize the efficiency of the freeway system. This brochure defines what managed lanes are, presents several managed lane success stories, discusses issues and challenges unique to managed lane projects, and explores the future of this freeway management approach.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/publications/managelanes_primer/managed_lanes_primer.pdf
- HyperText Markup Language (HTML) format: http://www.ops.fhwa.dot.gov/publications/managelanes_primer/index.htm



A Policy on Geometric Design of Highways and Streets, Fifth Edition (2004)

Known as the “Green Book,” this document discusses the geometric features of rural and urban highway design. The document contains design practices in widespread use as the standard for highway geometric design. New features of the Fifth Edition incorporates the latest research on super-elevation and side friction factors as presented in NHCPR Report# 439.

Cost: \$120-\$145 for the printed version, \$160-\$192 for the CD-ROM version, \$208-\$250 for both. Prices for the printed and CD-ROM versions vary depending on status of membership in the professional associations that publish the Green Book.

To Access This Resource: The Green Book printed and CD-ROM versions are available from the following professional associations:

- American Association of State Highway and Transportation Officials (AASHTO): Contact the AASHTO Bookstore, <https://bookstore.transportation.org>, (800) 231-3475, fax: (800) 525-5562.
- Institute of Transportation Engineers (ITE): Contact the ITE Bookstore, <http://www.ite.org/bookstore/index.asp>, (202) 289-0222 x130, fax: (202) 289-7722, publications@ite.org.



Telecommunications Handbook for Transportation Professionals: The Basics of Telecommunications (FHWA-HOP-04-034) (2004)

This handbook provides basic descriptions of terms and technologies that are commonly used (or considered) in the deployment of freeway management and traffic signal systems, including both voice and data communications. The handbook covers telecommunications fundamentals, the relationship between telecommunications and the National ITS Architecture, a step-by-step process for developing a telecommunications system, field devices, maintenance, warranties, and construction. The handbook also examines the Internet and cutting-edge technologies. Two case studies from Utah and Texas are provided.

Cost: Free

To Access This Resource: Access the website addresses:

- Adobe Acrobat format: http://ops.fhwa.dot.gov/publications/telecomm_handbook/telecomm_handbook.pdf
- HyperText Markup Language (HTML) format: http://ops.fhwa.dot.gov/publications/telecomm_handbook/index.htm



Freeway Management and Operations Handbook (FHWA-OP-04-003) (2003)

This handbook provides an overview of the institutional and technical issues associated with the planning, design, implementation, and management of a freeway network. The 2003 edition is an update of the 1997 edition and is the third update to be published by FHWA. The handbook examines a wide variety of strategies, tools, and technologies that can be used to support management and operation of the freeway network. Development of this handbook was sponsored by the Transportation Management Center Pooled-Fund Study (TMC PFS).

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/freewaymgmt/publications/frwy_mgmt_handbook/fmoh_complete_all.pdf
- HyperText Markup Language (HTML) format: http://www.ops.fhwa.dot.gov/freewaymgmt/publications/frwy_mgmt_handbook/index.htm



Highway Traffic Operations and Freeway Management State-of-the-Practice Final Report (FHWA-OP-03-076) (2003)

This white paper summarizes the state-of-the-practice in freeway management and operations. The white paper profiles institutional arrangements such as funding, procurement and staffing, as well as system functions such as freeway management systems, corridor traffic management, electronic toll and traffic management, decision-support systems, traveler information, traffic incident management, special events management, and communication systems. In addition, the white paper notes innovative approaches not in common use, thus identifying the gap between the state-of-the-practice and the state-of-the-art.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://www.ops.fhwa.dot.gov/freewaymgmt/publications/documents/FreewayManagementSOPV7.2.1.pdf>
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13801.html, EDL# 13801 or http://www.ops.fhwa.dot.gov/freewaymgmt/publications/documents/frwy_mgmtSOPv7_2_1.htm



What Have We Learned about Intelligent Transportation Systems? Chapter 2: What Have We Learned about Freeway, Incident, and Emergency Management and Electronic Toll Collection? (2000)

This document is an excerpt from a compendium report that looks back on the 10 years of the National ITS Program to examine which ITS technology applications have been successful, which have not been successful, and what the underlying factors are that determine success versus failure. This section examines freeway, incident, and emergency management and electronic toll collection systems.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13318.pdf, EDL# 13318.



Freeway Management and Operations (NHI Course# 133075 or 133075A)

This course provides participants with an appreciation and understanding of the key policies, institutional issues, challenges and barriers, technical, and other issues to consider in the planning, design, implementation, management, operation, evaluation, and marketing of freeway facilities. The key topics covered include introduction to freeway management and operations, freeway management as a component of traffic operations programs, performance monitoring and evaluation,

roadway and operational improvements, ramp management and control, lane management and control, high-occupancy vehicle (HOV) systems, traffic incident management, planned special events, information dissemination, transportation management centers, information sharing and integration, detection and surveillance, and communication media. This course addresses basic traffic flow theory for freeways and evaluation of freeway operations during project development and design. In addition, this course provides information on freeway traffic control systems, traffic management centers, and operations analysis procedures for freeways. Skill Level: Specialized learning. Target Audience: Federal, state, and local transportation professionals involved in planning, design, and implementation of freeway traffic operational improvements. Course Length: Two or three days.

Cost: \$300 per participant for the two-day course; \$400 per participant for the three-day course.

To Access This Resource: Access the following website addresses:

- Two-day course: http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "133075"
- Three-day course: http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "133075A"



High-Occupancy Vehicle Facilities Points-of-Contact

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- Jessie Yung, FHWA Office of Transportation Management, (202) 366-4672, Jessie.Yung@dot.gov
- Michael Baltes, FTA Office of Mobility Innovation, (202) 366-2182, Michael.Baltes@dot.gov

<http://>

High-Occupancy Vehicle (HOV) Information Section of the FHWA Office of Operations Website

This website is a compilation of resources related to high-occupancy vehicle (HOV) lanes. The site contains program guidance on HOV lanes, frequently asked questions (with answers), a list of available training courses, and links to several technical reference documents.

Cost: Free

To Access This Resource: Access the website address <http://ops.fhwa.dot.gov/freewaymgmt/hov.htm>.

<http://>

Transportation Research Board Committee AHB35 (formerly A3A06) on High-Occupancy Vehicle Systems Website

This site is the official website of the Transportation Research Board Committee AHB35 (formerly A3A06) on High-Occupancy Vehicle (HOV) Systems, as well as a compilation of resources about HOV lanes. The site contains the committee's mission, a list of upcoming HOV-related events, a link to the FHWA Inventory of HOV Systems, and an archive of HOV-related photographs available for downloading. One of the committee's main activities was organizing the 13th International HOV Systems Conference in 2007.

Cost: Free

To Access This Resource: Access the website address <http://www.HOVworld.com>.

http://

HOV Pooled-Fund Study Website

This site is the official website of the Pooled-Fund Study (PFS) on high-occupancy vehicle (HOV) systems. The purpose of the HOV Pooled-Fund Study is to identify and address the key issues and challenges that public agencies are facing with HOV facilities. The Pooled-Fund Study provides a mechanism to pursue projects that address common needs among participating members. Any agency responsible for planning, designing, implementing, managing, or operating HOV facilities is eligible to join, and the website has information on how to do so. The website also contains the Pooled-Fund Study's list of current projects and their status, charter, membership list, and materials related to past and upcoming meetings such as agendas, minutes, and handouts. The site also links to a searchable inventory of current and planned HOV facilities in the U.S. and Canada.

Cost: Free

To Access This Resource: Access the website address <http://hovpfs.ops.fhwa.dot.gov>.



12th International Conference on High-Occupancy Vehicle Systems: Conference Proceedings (2006)

These documents provide a summary of the 12th International Conference on High Occupancy Vehicle Systems, held April 18-20, 2005 in Houston, Texas. The conference was sponsored by the Transportation Research Board High-Occupancy Vehicle (HOV) Systems Committee. The proceedings summarize the presentations from the general and breakout sessions. Breakout sessions were organized around three topic areas: HOV facilities, bus rapid transit (BRT), and managed lanes.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/publications/12hovsysconf/12th_trb_hov_conf_proceed.pdf
- HyperText Markup Language (HTML) format: <http://www.ops.fhwa.dot.gov/publications/12hovsysconf/index.htm>



A Guide for HOT Lane Development (FHWA-OP-03-009) (2003)

This guide provides information on a wide range of policies and technical issues associated with high-occupancy toll (HOT) lanes, and focuses on how these matters are likely to differ from those associated with more traditional highway improvements. This guide includes case studies of the four existing HOT lane facilities in the U.S., as well as two recent HOT lane studies that are indicative of current trends.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13668_files/images/13668.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13668.html, EDL# 13668



Houston Managed Lanes Case Study: Evolution of the Houston HOV System (FHWA-OP-04-002) (2003)

This report examines the development and operation of the high-occupancy vehicle (HOV) lane system in Houston, Texas, and its recent transition to managed lanes. Managed lanes use a variety of tools and policies, such as occupancy, access control, and pricing strategies, to proactively manage demand and maintain free-flow traffic conditions. Started in 1979 with a single nine-mile reversible flow HOV lane, Houston's HOV network now includes over 100 miles of HOV lanes, 28 park-and-ride lots, four park-and-pool lots, transit centers, and express bus service that support these lanes. The report also documents the lessons learned from Houston's managed lane pilot project launched in 2002, including the institutional and technical issues to be considered when pursuing managed lanes.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://ops.fhwa.dot.gov/Docs/Houston/HoustonCaseStudy.pdf>
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13874.html, EDL# 13874 or <http://ops.fhwa.dot.gov/Docs/Houston/index.htm>



Effects of Changing HOV Lane Occupancy Requirements: El Monte Busway Case Study (2002)

This report documents the findings of an evaluation of the impact of lowering the HOV lane restrictions from 3+ to 2+ on the El Monte Busway in San Bernardino, California, in 1999. The report examines the impact of the change on Busway and freeway, operations public transit services, violation rates, crashes, and public response. The evaluation found that the lowering of HOV restrictions had a detrimental effect on busway, freeway, and public transit operations. The HOV restrictions were restored to 3+ the following year.

Cost: Free

To Access This Resource: Access the following website addresses:

- Executive Report (FHWA-OP-03-001)—Adobe Acrobat format: <http://www.ops.fhwa.dot.gov/freewaymgmt/publications/hov/ElMonteExecSummary.pdf>
- Executive Report (FHWA-OP-03-001)—HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13679.html, EDL# 13679
- Full Report (FHWA-OP-03-002)—Adobe Acrobat format: <http://www.ops.fhwa.dot.gov/freewaymgmt/publications/hov/ElMonteFinalReport.pdf>
- Full Report (FHWA-OP-03-002)—HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13692.html, EDL# 13692



High-Occupancy Vehicle (HOV) Interactive CD-ROM, Version 1.0 (2000)

This CD-ROM is a compilation of resources related to high-occupancy vehicle (HOV) facilities. The CD-ROM contains reports (including classic references dating back to the 1970s as well as current materials), an inventory of planned and operational HOV facilities in North America as of January 1998, and proceedings from the annual International Conference on HOV Systems.

Cost: Free

To Access This Resource: To order the CD-ROM, contact the Operations/ITS HelpLine, (866) 367-7487, itspubs@dot.gov.



New Jersey I-80 and I-287 HOV Lane Case Study (2000)

This report presents the lessons learned from a case study of HOV operations on the I-80 and I-287 in northern New Jersey. In 1999, the HOV lane designation for both freeways was rescinded after a substantial period of operation (four years for I-80 and 10 months for I-287). The case study indicates that although many elements associated with successful HOV projects were present to some extent, there were critical factors missing, modified, or not implemented during the operation of these HOV facilities and led to their termination. These elements include changes in the policy and regulatory environment and lack of sustained commitment and resources to continuously support the facilities.

Cost: Free

To Access This Resource: Access the following website addresses:

- Executive Report (FHWA-OP-01-004): http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13157.pdf, EDL# 13157
- Full Report (FHWA-OP-00-018): <http://www.itsdocs.fhwa.dot.gov/jpodocs/briefing/12963.pdf>, EDL# 12963



High-Occupancy Vehicle (HOV) Systems Manual (NCHRP Report# 414) (1998)

This manual is a comprehensive “how to” guide for the planning, design, implementation, operation, marketing, and enforcement of high-occupancy vehicle (HOV) facilities. The manual incorporates current guidelines and best practices. The intended audience is primarily highway and transit professionals, but the manual may also be useful to policymakers and others charged with achieving air quality and congestion management goals.

Cost: \$75

To Access This Resource: Contact the Transportation Research Board (TRB) Bookstore at <http://www.trb.org/bookstore> and search for “NR414,” (202) 334-3213, fax: (202) 334-2519.



HOV Marketing Manual: Marketing for Success (1994)

This manual presents “how to” guidance on the effective marketing of high-occupancy vehicle (HOV) lanes. The manual presents a step-by-step process for the planning, implementation, and evaluation of HOV marketing campaigns. The manual also contains case studies from seven HOV areas that have successfully used marketing to increase HOV lane use.

Cost: Free

To Access This Resource: Access the website address <http://www.ops.fhwa.dot.gov/freewaymgmt/publications/hov/prefforw.pdf>.



Intermodal Freight Points-of-Contact

- Kate Hartman, ITS Joint Program Office, (202) 366-2742, Kate.Hartman@dot.gov
- Mike Onder, FHWA Office of Freight Management and Operations, (202) 366-2639, Michael.Onder@dot.gov
- Rolf Schmitt, FHWA Office of Freight Management and Operations, (202) 366-9258, Rolf.Schmitt@dot.gov
- Randy Butler, FHWA Office of Freight Management and Operations, (202) 366-9215, Randy.Butler@dot.gov
- Crystal Jones, FHWA Office of Freight Management and Operations, (202) 366-2976, Crystal.Jones@dot.gov
- Deborah Curtis, FHWA Office of Research, Development and Technology, (202) 493-3267, Deborah.Curtis@dot.gov

<http://>

Freight Management Section of the FHWA Office of Operations Website

This site is the official website of the FHWA Office of Freight Management and Operations. The website links to pages relating to all aspects of freight management, such as institutional, infrastructure, operations and technology, and regulatory. The website contains resources related to state-of-the-art and state-of-the-practice issues in freight finance, the development of performance measures for freight productivity, and the economic benefits of freight. The website discusses the current status of several operational tests of the use of ITS technology to improve intermodal freight operations. The website also contains a section highlighting new activities and news items, a calendar of upcoming events, a list of contacts, and related links.

Cost: Free

To Access This Resource: Access the website address <http://www.ops.fhwa.dot.gov/freight>.



Freight Analysis Framework (FAF)

The Freight Analysis Framework (FAF) is a policy analysis tool that evaluates the effect of expected volumes on the transportation networks in four key transportation modes: highways, railroads, water, and air. The FAF then enables users to analyze geographic relationships between congestion and freight movements in four key transportation modes: highway, railroad, water, and air. The FAF enables users to determine which transportation corridors are or will become heavily congested in the future, so that they can develop solutions to help alleviate bottleneck points. The FAF includes economic forecasts for 2010 and 2020, and translates these economic data into transportation demand figures that can then be assigned to network links.

Cost: Free

To Access This Resource: Access the website address

http://www.ops.fhwa.dot.gov/freight/freight_analysis/faf/index.htm.



The Freight Story: A National Perspective on Enhancing Freight Transportation (FHWA-OP-03-004) (2002)

This report examines the role of freight transportation in the U.S. economy. The report examines trends in freight transportation brought about by a changing business environment (shift to a service economy, deregulation, “pull logistics,” and globalization) and discusses key challenges freight transportation is currently facing (such as congestion, financing, safety, and national security). The report concludes with recommended strategies to enhance the productivity and security of freight transportation, not just in the U.S., but throughout North America.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/freight/freight_analysis/freight_story/freight.pdf
- HyperText Markup Language (HTML) format: http://www.ops.fhwa.dot.gov/freight/freight_analysis/freight_story/index.htm



Manual on Uniform Traffic Control Devices Points-of-Contact

- Hari Kalla, FHWA Office of Transportation Operations, (202) 366-5915, Hari.Kalla@dot.gov
- Kevin Sylvester, FHWA Office of Transportation Operations, (202) 366-2161, Kevin.Sylvester@dot.gov
- Scott Wainwright, FHWA Office of Transportation Operations, (202) 366-0857, Scott.Wainwright@dot.gov
- Fred Ranck, FHWA Resource Center, (708) 283-3545, Fred.Ranck@dot.gov
- Ken Wood, FHWA Resource Center, (708) 283-4340, Ken.Wood@dot.gov

<http://>

Manual on Uniform Traffic Control Devices Website

This website is a compilation of resources related to the *Manual on Uniform Traffic Control Devices (MUTCD)*. The site contains an overview of the MUTCD, information about the significance of the 2003 Edition, a side-by-side comparison of the old and new versions of the manual, and an online discussion forum. The site also contains a list of frequently asked questions (with answers), Federal Register announcements, policy statements, related publications, outreach materials, training, contacts, and related links.

Cost: Free

To Access This Resource: Access the website address <http://mutcd.fhwa.dot.gov>.



MUTCD Peer-to-Peer Program

The MUTCD Peer-to-Peer Program provides a way for transportation officials to get answers to their questions about traffic control device issues. The program quickly connects volunteers with expertise in specific traffic control devices with professionals who need guidance with technical issues pertaining to the *Manual on Uniform Traffic Control Devices (MUTCD)* and related technologies. For more information about the program, access the website address http://mutcd.fhwa.dot.gov/tech_p2p.htm.

Cost: Free

To Access This Resource: Contact the MUTCD Peer-to-Peer Program, (866) P2P-FHWA ([866] 722-3492), fax: (877) 663-2263, mutcdp2p@dot.gov.



Standard Highway Signs, 2004 Edition (2004)

This document contains detailed drawings and measurements of more than 400 highway signs. As a companion to the *Manual on Uniform Traffic Control Devices (MUTCD)*, this document covers the signs mentioned in the 2003 Edition of the MUTCD, as well as other frequently used highway signs. The online version of *Standard Highway Signs* contains the Metric Standard Alphabets for Highway Signs and Pavement Markings (SAHSPM) and the English Standard Alphabets for Highway Signs. The SAHSPM contains the metric series of letters and appropriate metric spacing charts for designing signs and installing pavement markings. The SAHS contains the English series of letters and English spacing charts.

Cost: Free

To Access This Resource: Access the website addresses:

- Metric version: http://mutcd.fhwa.dot.gov/ser-shs_millennium_met.htm
- English version: http://mutcd.fhwa.dot.gov/ser-shs_millennium_eng.htm



Manual on Uniform Traffic Control Devices: 2003 Edition (2003)

The *Manual on Uniform Traffic Control Devices (MUTCD)* defines the standards used by road managers nationwide to install and maintain traffic control devices on all streets and highways. The MUTCD is published by the Federal Highway Administration under the 23 Code of Federal Regulations (CFR), Part 655, Subpart F. The 2003 Edition is the first major update of the MUTCD since the Millennium Edition was published in 2000. The MUTCD is continually being updated to include amendments that clarify new standards and incorporate technological advances.

Cost: Free for the online version; \$60-\$96 for the printed version. Prices for the printed version vary depending on status of membership in the professional associations that publish the MUTCD, type of binding, and number of copies ordered.

To Access This Resource: For the most recent version of the online version, access the website address http://mutcd.fhwa.dot.gov/kno_2003r1r2.htm. The printed version is available from the following professional associations:

- American Association of State Highway and Transportation Officials (AASHTO): Contact the AASHTO Bookstore, <https://bookstore.transportation.org>, (800) 231-3475, fax: (800) 525-5562.
- Institute of Transportation Engineers (ITE): Contact the ITE Bookstore, <http://www.ite.org/bookstore/index.asp>, (202) 289-0222 x130, fax: (202) 289-7722, publications@ite.org.
- American Traffic Safety Services Association (ATSSA): Contact the ATSSA Products division, <http://www.atssa.com/cs/roadway-safety-store>, (800) 272-8772, fax: (540) 368-1711, products@atssa.com.



National Transportation Operations Coalition Point-of-Contact

Zia Burleigh, FHWA Operations Support Team,
(202) 366-1896, Zia.Burleigh@dot.gov



National Transportation Operations Coalition Website

This website is a compilation of resources provided by the National Transportation Operations Coalition (NTOC). The Coalition is a partnership between traditional stakeholders, such as transportation professionals, and nontraditional stakeholders, such as public safety agencies. This alliance of national associations, practitioners, and private sector groups allows stakeholders to work collectively to identify barriers and opportunities for improving the management and operations of the nation's transportation system. The site contains the history of the Coalition, current action plan, vision, and mission. The site also contains resource documents that present a number of transportation operations issues and improvement strategies, links to other operations and ITS resources (including electronic forums for transportation operations, and the Talking Operations webcast series), proceedings from Coalition events, and a list of Coalition members and key partner organizations.

Cost: Free

To Access This Resource: Access the website address
<http://www.ntoctalks.com>.



National Transportation Operations Coalition Forums

"Operations" and "ITS" mean different things to different people. The National Transportation Operation Coalition (NTOC) has developed two electronic forums—the Talking Operations forum and the ITS Technology forum—to provide a venue for online discussion of operations and ITS issues among a diverse group of stakeholders, such as engineers, operators, planners, academia, private sector, policy makers, elected and appointed officials, and local, state, and Federal governments. These discussion forums

are designed to help frame the issues surrounding effective operations and the use of ITS.

Cost: Free

To Access This Resource: Access the website address <http://www.ntoctralks.com/forums.php>.



Show Me the Money: A Decision Maker's Funding Compendium for Transportation Systems Management and Operations (2006)

This document explores the different options to fund transportation management and operations investments. The document contains 22 case studies that show how state and local governments combined different funding resources to meet the needs of their diverse transportation programs. The document explores the definition of "transportation systems management and operations" by showing how it relates to familiar concepts, such as maximizing operational capacity, minimizing the impact of incidents, integrating elements of a multimodal system, maximizing safety, and integrating transportation into livable communities. The document concludes with a list of Federal funding sources and examples of programs that are eligible to receive these funds.

Cost: \$25 for members of the Public Technology Institute (PTI); \$50 for non-members.

To Access This Resource: Contact the PTI Store at <http://www.pti.org/index.php/ptiee1/inside/C47>.



Association White Papers on the National Dialogue on Transportation Operations (2001)

These white papers were written by professional associations that have been engaged in the National Dialogue on Transportation Operations, which focuses on opportunities and barriers to improving the operation and management of the transportation system. The white paper written by each professional association expresses its constituents' positions and recommendations on a

wide range of issues, such as the definition of management and operations, funding, institutional challenges, and appropriate Federal actions. A synthesis paper identifies the similarities and differences among the organizations' views.

Cost: Free

To Access This Resource: Access the following website addresses:

- Synthesis: <http://www.ite.org/NationalSummit/association/Synthesis-Final.pdf>
- Association of American State Highway and Transportation Officials (AASHTO): <http://www.ite.org/NationalSummit/association/AASHTO.pdf>
- Association of Metropolitan Planning Associations (AMPO): <http://www.ite.org/NationalSummit/association/AMPO%20Final.pdf>
- American Public Transportation Association (APTA): <http://www.ite.org/NationalSummit/association/APTA%20Final.pdf>
- American Public Works Association (APWA): <http://www.ite.org/NationalSummit/association/APWATranspOpsPositionPaper8.30.01.pdf>
- American Traffic Safety Services Association (ATSSA): <http://www.ite.org/NationalSummit/association/ATSSA%20Final.pdf>
- International City/County Management Association (ICMA): <http://www.ite.org/NationalSummit/association/ICMA.pdf>
- Institute of Transportation Engineers (ITE): <http://www.ite.org/NationalSummit/association/ITE%20Final.pdf>
- Intelligent Transportation Society of America (ITS America): <http://www.ite.org/NationalSummit/association/ITSA.pdf>
- National Association of City Transportation Officials (NACTO): <http://www.ite.org/NationalSummit/association/NACTO.pdf>
- Public Technology, Inc. (PTI): <http://www.ite.org/NationalSummit/association/PTI%20Final.pdf>



Vision White Papers on the National Dialogue on Transportation Operations (2001)

This series of white papers was written by nationally recognized experts to identify both reauthorization and programmatic opportunities to improve the operation and management of the nation's transportation system through the Transportation Equity Act for the 21st Century (TEA-21). The papers serve as an intellectual underpinning for operations and focus on a wide variety of topics, such as TEA-21 reauthorization options, system performance, funding performance measurement, and data and information requirements.

Cost: Free

To Access This Resource: Access the following website addresses:

- Description of Transportation Systems Operations and Management: <http://www.ite.org/NationalSummit/vision/DescriptionofTS.pdf>
- Development of an Intellectual Foundation to Support the Establishment of Transportation Operations as a Transportation Agency Core Mission: Developing the Concept of Planning for Operations: <http://www.ite.org/NationalSummit/vision/IntellectualFoundation.pdf>
- Highway Funding: It's Time to Think Seriously about Operations—A Policy Framework: <http://www.ite.org/NationalSummit/vision/HighwayOps.pdf>
- Institutions for Transportation Operations with Recommendations for Reauthorization: <http://www.ite.org/NationalSummit/vision/institutions.doc>
- Integrated Public Safety and Highway Operations: A Policy Framework and Analysis: <http://www.ite.org/NationalSummit/vision/PublicSafety.pdf>
- Managing the Urban Transportation System: The Need for a New Operating Paradigm: <http://www.ite.org/NationalSummit/vision/Managing.pdf>
- Measuring System Performance: The Key to Establishing Operations as a Core Agency Mission: <http://www.ite.org/NationalSummit/vision/Performance.pdf>

- Operations in the 21st Century: 25th Annual Meeting of ITS America: <http://www.ite.org/NationalSummit/vision/Operations.pdf>
- Summary of Transportation Operations Data Issues: <http://www.ite.org/NationalSummit/vision/DataIssues.pdf>
- Traffic Congestion and Travel Reliability: How Bad Is the Situation and What Is Being Done about It?: <http://www.ite.org/NationalSummit/vision/Congestion.pdf>
- Transportation Operations: An Organizational and Institutional Perspective: <http://www.ite.org/NationalSummit/vision/TransOps.pdf>



Operations and Management: What Does It Mean for Local Agencies? (2000)

This report defines transportation systems operations and management (O&M) by discussing several O&M strategies, including traveler information, public policy, improved connections between transportation modes, benchmarking and performance measures, and inter-jurisdictional coordination. The report also discusses how growth is increasing the need for effective O&M and explores the new kinds of staff training that O&M requires.

Cost: \$12 for members of the Public Technology Institute (PTI); \$20 for non-members.

To Access This Resource: Contact the PTI Store at <http://www.pti.org/index.php/ptiee1/inside/C47>.



Advancing Transportation Systems Management and Operations (NHI Course# 133098)

This course provides an understanding of Transportation Systems Management and Operations (TSM&O) in a regional context. The transportation challenges of the 21st century require a significant cultural shift in the way transportation systems are managed and operated. This means moving from limited interactions between planners and operators to a solid linkage

that facilitates data sharing, joint development of regional operations opportunities, resource sharing, and supportive institutional arrangements. From an operations perspective, this cultural shift requires anticipating user needs 24/7, focusing on customers, and changing to performance-based policies and procedures. To be successful, the new norm requires a cross-jurisdictional, multi-agency, and multimodal perspective. From a planning standpoint, this cultural shift means bringing “operations thinking” into the planning process. Smart planning requires that ongoing operations be considered in regional planning and investment decisions. This course explores 21st century transportation challenges and how to advance TSM&O through a cultural shift in operations and planning. Target Audience: Transportation managers, service providers, public safety officials, public works directors, and business sector members of chambers of commerce. Operators and planners from states, cities, counties, and metropolitan planning organizations (MPOs) also benefit from this course. Course Length: One day.

Cost: \$200 per participant

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number “133098.”



Parking Management Systems Points-of-Contact

- Allen Greenberg, FHWA Office of Transportation Management, (202) 366-2425, Allen.Greenberg@dot.gov
- Quon Kwan, FMCSA Office of Analysis, Research and Technology, (202) 385-2389, Quon.Kwan@dot.gov



Planned Special Events: Checklists for Practitioners

This tool is a series of six checklists that outline the steps for managing traffic before, during, and after planned special events. The steps outlined in these checklists are based on Chapters 4 through 10 of the handbook *Managing Travel for Planned Special Events*. Each step incorporates several assessments designed to address the effects that planned special events may have on traffic, parking, pedestrian access, and transit operations. The assessments include consideration of such factors as travel demand, road capacity, site capacity, event operation, and available resources.

Cost: Free

To Access This Resource: Access the website address <http://www.ops.fhwa.dot.gov/publications/psechecklists/index.htm>.



Advanced Parking Management Systems: A Cross-Cutting Study (FHWA-JPO-07-011) (2007)

This report is one in a series designed to educate public sector managers about particular ITS technologies. This report explains how ITS technologies can be used to inform travelers about where the best parking locations are, what hours they are open, what fees they charge, and, most importantly, whether a parking space will be available when they arrive. This report presents the full range of advanced parking management systems (APMS) technologies, from low-tech solutions such as a parking information website to cutting-edge parking reservation systems

that enable drivers to locate, reserve, and pay for a parking space, all through wireless communications. The report profiles advanced parking management systems in Washington State, Illinois, and Maryland. The study concludes with a summary of the benefits and costs of this new technology, as well as lessons learned in the areas of policy and planning, design and deployment, and management and operations.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS HelpLine, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14318_files/14318.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14318.htm, EDL# 14318



Intelligent Transportation Systems and Truck Parking (FMCSA-MCRR-05-001) (2005)

This report discusses key issues concerning deployment of technologies that convey real-time information on parking availability for truckers on the road. The report addresses the following questions: Is there a shortage of parking? Is the truck parking shortage likely to worsen? What are potential solutions? What can be done to better match supply and demand?

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://www.fmcsa.dot.gov/facts-research/research-technology/report/intelligent-transportation-truckparking.pdf>
- HyperText Markup Language (HTML) format: <http://www.fmcsa.dot.gov/facts-research/research-technology/report/intelligent-transportation-truckparking.htm>



Managing Demand Through Travel Information Services (FHWA-OP-05-005) (2005)

This report explores the opportunities and benefits of using traveler information services to manage traveler demand during periods of severe congestion. Three different types of travel demand situations are examined: (1) commuting to and from work, (2) predictable situations such as work zones, planned special events, tourism, and parking management, and (3) less predictable situations such as incidents, adverse weather conditions, hurricanes, and other catastrophic events. Scattered throughout the report are examples of the traveler information technologies that states and municipalities across the U.S. are using to manage traveler demand, including websites, dedicated TV channels, dynamic message signs, e-mail alert services, “next bus” signs, and “smart park” systems. The report concludes with lessons learned and a discussion of the future direction of traveler information and its implications for managing travel demand.

Cost: Free

To Access This Resource: Access the website address http://www.ops.fhwa.dot.gov/publications/manag_demand_tis/travelinfo.htm.



Commuter Choice Primer: An Employer’s Guide for Implementing Effective Commute Choice Programs (FHWA-OP-03-007) (2003)

This document shows employers how to apply travel demand management (TDM) strategies to help alleviate transportation problems affecting the worksite, such as congestion, accessibility, parking, and mobility. Building upon traditional TDM strategies, the document introduces the broader concept of commuter choice, which includes the full spectrum of travel options: how commuters get to work (mode choice), when they travel (time choice), where they work (location choice), and which way they travel (route choice). The hardcopy also contains the Commuter Choice Decision Support System software on CD-ROM.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS HelpLine, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_pr/13669/CommuterChoicePrimer.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_pr/13669.html, EDL# 13669



Multipurpose Transit Payment Media (TCRP Report# 32) (1998)

This report examines the potential for introducing multipurpose payment smart cards that can be used to purchase transit services from multiple operators, as well as other goods and services such as parking and retail products. Topics covered include smart card technology, the legal and institutional issues associated with introducing multipurpose smart card programs, cost and revenue impacts, and customer acceptance. The report presents guidelines for the development of multipurpose fare payment programs. The intended audience for this report includes transit managers, transit operations personnel involved with fare collection, parking professionals, and representatives of the financial services industry.

Cost: \$36 for the hardcopy version; the online version is free.

To Access This Resource: To order the hardcopy version, contact the Transportation Research Board (TRB) Bookstore at <http://www.trb.org/bookstore> and search for "TC032," (202) 334-3213, fax: (202) 334-2519. For the online version, access the website address http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_32.pdf.



Planning and Integration Points-of-Contact

- Steve Clinger, FHWA Office of Transportation Management, (202) 366-2168, Stephen.Clinger@dot.gov
- Bob Rupert, FHWA Office of Transportation Management, (202) 366-2194, Robert.Rupert@dot.gov
- Wayne Berman, FHWA Office of Transportation Management, (202) 366-4069, Wayne.Berman@dot.gov
- Richard Blacklund, FHWA Office of Transportation Management, (202) 366-8333, Richard.Blacklund@dot.gov
- Brian Gardner, FHWA Office of Planning, (202) 366-4061, Brian.Gardner@dot.gov
- Gloria Shepherd, FHWA Office of Planning, (202) 366-0106, Gloria.Shepherd@dot.gov
- Harlan Miller, FHWA Office of Planning, (202) 366-0847, Harlan.Miller@dot.gov
- Dale Thompson, FHWA Office of Research, Development and Technology, (202) 493-3420, Dale.Thompson@dot.gov
- Mac Lister, FHWA Resource Center, (708) 283-3532, Mac.Lister@dot.gov
- Charlie Goodman, FTA Metropolitan Planning Division, (202) 366-1944, Charles.Goodman@dot.gov



Planning for Transportation System Management and Operations Website

This website is a compilation of resources related to the use of multimodal planning practice to support transportation system management and operations. The website contains links to resources to help with performance measurement, congestion management systems, regional ITS architecture, institutional arrangements, data collection and sharing, funding and resource sharing, and regional transportation systems management and operations. In addition, the website contains links to software tools and upcoming training opportunities, a glossary, frequently asked questions (with answers), a calendar of upcoming events, points-of-contact, and related links.

Cost: Free

To Access This Resource: Access the website address
<http://www.plan4operations.dot.gov>.

<http://>

Traffic Analysis Tools Section of the FHWA Office of Operations Website

This website is a compilation of resources related to traffic analysis tools. This website explains what traffic analysis tools are and what challenges these tools were designed to address, and recommends a process for identifying and organizing stakeholders. The website examines how traffic analysis tools can be used to plan for freeway management, traffic incident management, arterial management, work zone management, emergency management, travel demand management, and traveler information systems. The website contains information and updates on the FHWA Next Generation Simulation (NGSIM) Program. NGSIM Program materials include workshop proceedings, a summary of a simulation feasibility study, a summary of responses to a Request for Information (RFI) soliciting information on the program, a 19-slide presentation on the program, and a list of people who attended an information meeting on the program held in January 2001. The website also lists new features available with the latest version of one traffic analysis tool—Traffic Software Integrated System (TSIS) Version 5.0.

Cost: Free

To Access This Resource: Access the website address
<http://ops.fhwa.dot.gov/trafficanalysistools/index.htm>.



ITS Deployment Analysis System (IDAS)

The ITS Deployment Analysis System (IDAS) performs sketch planning analysis of ITS deployments. Planners and other transportation professionals can use IDAS to calculate relative costs and benefits of ITS investments, which are either alternatives to or enhancements of traditional highway and transit infrastructure investments. The current version of IDAS can predict relative costs and benefits of more than 60 types of ITS investments. For more information about IDAS, access the IDAS website at <http://idas.camsys.com>.

Cost: \$795

To Access This Resource: Order IDAS through the McTrans Center for Microcomputers in Transportation at the University of Florida, (352) 392-0378, fax: (352) 392-3224, mctrans@ce.ufl.edu, <http://mctrans.ce.ufl.edu>.



Turbo Architecture Version 4.0

Turbo Architecture is an interactive software tool for regional and project-specific ITS architecture development. By helping the user integrate multiple project architectures with a regional architecture and with each other, Turbo Architecture makes it easier to develop an architecture consistent with the National ITS Architecture. Turbo Architecture Version 4.0 is compatible with the National ITS Architecture 6.0, has added new interfaces and flows, has updated equipment package descriptions, function requirements, and ITS standards information, and is compatible with Microsoft Vista.

Cost: Free

To Access This Resource: Turbo Architecture Version 4.0 is available as part of the National ITS Architecture Version 6.0, in both CD-ROM and online formats. For the online version, access the website address <http://www.iteris.com/itsarch/html/turbo/turbomain.htm>. To order the National ITS Architecture Version 6.0 on CD-ROM, contact the Operations/ITS HelpLine, (866) 367-7487, itspubs@dot.gov.



An Interim Guidebook on the Congestion Management Process in Metropolitan Transportation Planning (FHWA-HOP-08-008) (2008)

This guidebook is one of two in a series that promotes effective approaches to integrating management and operations strategies into metropolitan and statewide transportation planning, including the Congestion Management Process (CMP) required in large metropolitan areas. These guidebooks present both a policy basis and the business case for stronger coordination and cooperation between transportation planners and systems

operators, among modes, and throughout an entire region. This particular guidebook in the series discusses how to develop and implement a Congestion Management Process (CMP) that is both objectives-driven and performance-based. The CMP is required as an integral part of the metropolitan planning process in all Transportation Management Areas (TMAs), i.e., urbanized areas with a population of over 200,000 and other specially designated TMAs. Although the CMP is not required in non-TMA regions, these regions may want to consider developing and implementing an objectives-driven performance-based CMP for the many benefits of doing so. Both guidebooks are designated as “interim” because they will be revised based on feedback received during an extensive marketing and outreach effort.

Cost: Free

To Access This Resource: Access the website address <http://www.ops.fhwa.dot.gov/publications/cmpguidebook/index.htm>.



Management & Operations in the Metropolitan Transportation Plan: A Guidebook for Creating an Objectives-Driven, Performance-Based Approach—Interim Draft (FHWA-HOP-08-007) (2007)

This guidebook is one of two in a series that promotes effective approaches to integrating management and operations strategies into metropolitan and statewide transportation planning, including the Congestion Management Process (CMP) required in large metropolitan areas. These guidebooks present both a policy basis and the business case for stronger coordination and cooperation between transportation planners and systems operators, among modes, and throughout an entire region. This particular guidebook in the series discusses how to integrate transportation system management and operations (TSM&O) into the metropolitan planning process. This guidebook can assist metropolitan planning organizations (MPOs) in meeting Federal requirements under the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) legislation that calls for inclusion of management and operations

(M&O) strategies in each region's metropolitan transportation plan (MTP). This guidebook shows the benefits of achieving a balance between infrastructure and operations, by using a plan that is founded upon measurable, performance-based regional transportation objectives. Both guidebooks are designated as "interim" because they will be revised based on feedback received during an extensive marketing and outreach effort.

Cost: Free

To Access This Resource: Access the website address
<http://www.ops.fhwa.dot.gov/publications/moguidebook/index.htm>.



Regional Concept for Transportation Operations: The Blueprint for Action (FHWA-HOP-07-122) (2007)

This primer provides an introduction to a regional concept for transportation operations (RCTO), a management tool to assist in planning and implementing transportation management and operations strategies on a regional basis in a collaborative and sustained manner. This primer discusses what RCTO is, how one would fit into a regional context, how to develop one, and how to get others in a region to support one. Real-world examples from Arizona, Colorado, Michigan, Virginia and the Washington, D.C. metropolitan area are presented, along with three hypothetical case studies that illustrate steps in the RCTO development process.

Cost: Free

To Access This Resource: Access the website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/publications/rctoprimer/rcto_primer.pdf
- HyperText Markup Language (HTML) format: <http://www.ops.fhwa.dot.gov/publications/rctoprimer/index.htm>



Getting More by Working Together: Opportunities for Linking Planning and Operations (FHWA-HOP-05-016) (2004)

Traditionally, planning and operating the transportation system have been two relatively detached sets of activities with different requirements and different working cultures. The goal of this reference manual is to bridge that gap, to help planning and operations managers understand the value of working together and to realize the benefits of pursuing management and operations strategies on a regional scale. The manual discusses why building stronger links is beneficial, highlights nine areas that provide opportunities for better linkages, and includes a self-assessment tool that agencies can use to see how well they are currently working together and to identify potential areas for improvement. This manual is the product of a partnership between the FHWA Office of Operations and the FHWA Office of Planning, Environment, and Realty.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/publications/lpo_ref_guide/hop05016.pdf
- HyperText Markup Language (HTML) format: http://www.ops.fhwa.dot.gov/publications/lpo_ref_guide/index.htm



Crossing Boundaries: On the Road to Public-Public Partnerships (FHWA-OP-03-139) (2003)

This report documents the findings of a series of focus groups and an online survey conducted by the Public Technology Institute (PTI), among state and local agencies. The surveys solicited observations and recommendations concerning collaboration among government agencies at the Federal, state, and local levels. The report examines what factors would facilitate both horizontal and vertical collaboration, especially in light of reauthorization of the Transportation Equity Act for the 21st Century (TEA-21) and the new transportation security environment following the terrorist attacks of September 11, 2001.

Cost: \$25 for PTI members; \$50 for non-members.

To Access This Resource: Contact the PTI Store at <http://www.pti.org/index.php/ptiee1/inside/C47>.



Incorporating Intelligent Transportation Systems into Planning Analysis: Summary of Key Findings from a Seattle 2020 Case Study (FHWA-OP-02-031) (2002)

This report presents a new transportation modeling technique that shows how ITS can improve the reliability of the transportation infrastructure. This new technique is especially useful because traditional analytical tools often fail to capture how transportation improvements perform under a wide range of conditions.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13605/13605.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13605.html, EDL# 13605



Metropolitan ITS Integration: A Cross-Cutting Study (FHWA-OP-02-083/FTA-TRI-11-02-05) (2002)

This report, one in a series designed to educate public sector managers about particular ITS technologies, profiles how 24 cities in the U.S. have achieved integration of previously disparate ITS systems, the benefits they have gained as a result, and the lessons they have learned. The report concludes with a series of successful practices for making ITS integration a reality, in the areas of planning, design, implementation, and operations and maintenance.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13672_files/13672.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13672.html, EDL# 13672



Regional Transportation Operations Collaboration and Coordination: A Primer for Working Together to Improve Transportation Safety, Reliability, and Security (FHWA-OP-03-008) (2002)

This document introduces the concept of “Regional Transportation Operations Collaboration and Coordination,” which is based on the belief that in order for regional transportation operations activities to be effective, managers responsible for operating a transportation system on a day-to-day basis need to collaborate and coordinate on a continual basis. The managers need to agree on a shared operations vision, a concept of how regional activities should be operated over time, how improvements should be made to the transportation system, and what measures should be used to evaluate performance. This primer explains what collaboration and coordination means in regional transportation operations, why they are important, and how to get started.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/ITS1007.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13686.html, EDL# 13686



Using Metropolitan ITS Deployment Tracking for Regional ITS Planning: Telling the Deployment Story in Tucson, Arizona (FHWA-OP-02-035) (2002)

This case study examines how the Pima Association of Governments (PAG) used the methodology contained in the Metropolitan ITS Deployment Tracking Database to develop its ITS Strategy Deployment Plan. Using the methodology contained in the database allows agencies to compare their current ITS assets with what is possible (the “could” case), as well as with the region’s long-term goals (the “should” case).

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13606_files/13606.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13606.html, EDL# 13606



Guidance on Including ITS Elements in Transportation Projects (2001)

This document provides guidance for including ITS equipment and technologies as part of traditional transportation construction and maintenance projects. The document outlines a step-by-step process for conducting a site-specific ITS assessment, and provides a hypothetical case study. Appendices contain a detailed bibliography, a list of helpful hints, an overview of the transportation planning process and project cycle, tables from the ITS unit costs database, and a sample mapping of ITS infrastructure to related traditional capital projects.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13467.pdf, EDL# 13467.



Organizing for Regional Transportation Operations (2001)

This series of reports examines how several locations across North America are focusing on regional operations activities through partnerships among transportation and public safety agencies that provide coordinated transportation operations on a 24-hour-per-day, seven-days-per-week basis. An Executive Guide examines the key features and critical elements impacting the development and long-term stability of regional operating organizations (ROOs). Individual case studies present the regional context, development history, organizational structure, key achievements, challenges encountered, and best practices employed in particular locations.

Cost: Free

To Access This Resource: To order a hardcopy, contact Wayne Berman, FHWA Office of Transportation Management, (202) 366-4069, Wayne.Berman@dot.gov. For the online version, access the following website addresses:

- An Executive Guide (FHWA-OP-01-137):
<http://www.ite.org/library/ROOExecutiveGuide.pdf>
- Arizona AZTech Case Study (FHWA-OP-01-138):
<http://www.ite.org/library/Arizona.pdf>
- Houston TranStar Case Study (FHWA-OP-01-139):
<http://www.ite.org/library/HoustonTranStar.pdf>
- New York/New Jersey/Connecticut TRANSCOM Case Study (FHWA-OP-01-140): <http://www.ite.org/library/Transcom.pdf>
- San Francisco Bay Area Case Study (FHWA-OP-01-141):
<http://www.ite.org/library/SanFrancisco.pdf>
- Southern California ITS Priority Corridor Case Study (FHWA-OP-01-142): <http://www.ite.org/library/SouthernCali.pdf>
- Vancouver TransLink Case Study (FHWA-OP-01-143):
<http://www.ite.org/library/Vancouver.pdf>



Let's Talk It Over—Interagency Cooperation Facilitates Success: The New York/New Jersey/Connecticut Metropolitan Area TRANSMIT Operational Test (FHWA-JPO-99-019/FTA-TRI-11-99-14) (2000)

This report is one in a series designed to educate public sector managers about particular ITS technologies. It is often said that the more daunting barriers to ITS deployment are not technical in nature, but institutional. This report explores how the numerous transportation agencies in the New York/New Jersey/Connecticut metropolitan area came together to meet institutional challenges and achieved a successful implementation of the TRANSMIT operational test.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/11493.pdf.



What Have We Learned about Intelligent Transportation Systems? Chapter 7: What Have We Learned about Cross-Cutting Technical and Programmatic Issues? (2000)

This document is an excerpt from a compendium report that looks back on the 10 years of the National ITS Program to examine which ITS technology applications have been successful, which have not been successful, and what the underlying factors are that determine success versus failure. This section examines cross-cutting technologies for surveillance and communications, as well as programmatic issues, such as planning and analysis tools, archived data, standards, and architecture.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13323.pdf, EDL# 13323.



What Have We Learned about Intelligent Transportation Systems? Chapter 8: What Have We Learned about Cross-Cutting Institutional Issues? (2000)

This document is an excerpt from a compendium report that looks back on the 10 years of the National ITS Program to examine which ITS technology applications have been successful, which have not been successful, and what the underlying factors are that determine success versus failure. This Planning and Integration section examines institutional and other non-technical barriers to ITS deployment and presents solutions that have been used to overcome these barriers.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13324.pdf, EDL# 13324.



Successful Approaches to Deploying a Metropolitan Intelligent Transportation System (FHWA-JPO-99-032) (1999)

This report, published on interactive CD-ROM, presents the findings of an analysis of institutional and other non-technical barriers that the public sector encountered while deploying ITS in four metropolitan areas selected as part of the Metropolitan Model Deployment Initiative (MMDI). This report recommends nine approaches that were used successfully by the public sector participants at the MMDI sites. An extensive compilation of appendices reproduces documentation that the MMDI public sector participants found instrumental in their efforts to overcome institutional and non-technical barriers. Types of documents include Federal and state policies, operating procedures, contracts, memoranda-of-understanding, organizational charts, and marketing and outreach plans. While the lessons from the Metropolitan Model Deployment Initiative were learned almost a decade ago, they still have applicability to today's ITS deployment.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/8483.pdf, EDL# 8483. To order the CD-ROM, contact the Operations/ITS HelpLine, (866) 367-7487, itspubs@dot.gov.



Turbo Architecture Software Training (NHI Course# 137029A)

This course provides training on how to use Turbo Architecture, which is a software tool for regional and project-specific architecture development. Target Audience: Public sector transportation professionals at the state, county, city, and metropolitan planning organization (MPO) levels, as well as private sector consultants who are developing regional and project architectures. Skill Level: Specialized training. Course Length: Two days.

Cost: \$300 per participant. The sponsoring organization is responsible for providing 400 Mhz microcomputers running Windows SE or better, color monitors, and a hard disk with 50 Mb free storage memory.

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137029A."



Roles of the Public & Private Sectors in ITS: Cooperative Partnerships

This course examines some of the critical success factors of cooperative partnerships and offers a suggested approach to partnering. The course presents important issues (legal, regulatory, procurement, public policy, etc.) associated with the establishment of partnerships. In addition, the course provides real-life examples of both successful and unsuccessful attempts at partnerships in the area of ITS. Target Audience: Public sector transportation professionals including Federal engineers, planners, project managers, and field staff and others as appropriate. Transportation professionals from state, regional, and local agencies would also benefit from participation in the course. Course Length: Eight hours.

Cost: \$175 per participant

To Access This Resource: Access the website address <http://www.citeconsortium.org/courses/2mod12.html> or contact Kathleen Frankle, Consortium of ITS Training and Education (CITE), (410) 414-2925, KFrankle@umd.edu.



Road Weather Management Points-of-Contact

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- Patrick Kennedy, FHWA Office of Transportation Operations, (202) 366-9498, Pat.Kennedy@dot.gov
- Rudy Persaud, FHWA Office of Research, Development and Technology, (202) 493-3391, Rudy.Persaud@dot.gov
- Randy VanGorder, FHWA Office of Research, Development and Technology, (202) 493-3266, Randall.VanGorder@dot.gov
- Ray Murphy, FHWA Resource Center, (708) 283-3517, Ray.Murphy@dot.gov
- Charlene Wilder, FTA Service Innovation Division, (202) 366-1077, Charlene.Wilder@dot.gov

<http://>

Road Weather Management Section of the FHWA Office of Operations Website

This site is the official website of the Road Weather Management Program. The website contains an overview of the program and a schedule of upcoming events, as well as information on weather impacts, weather mitigation technologies and strategies, training and equipment providers, road weather research and development efforts, and related links. The website also provides summaries of several ongoing projects and applications, a list of hundreds of road weather-related publications, and links to nearly 40 statewide road weather condition websites.

Cost: Free

To Access This Resource: Access the website address <http://www.ops.fhwa.dot.gov/Weather/index.asp>.

http://

Clarus Initiative Website

This site is a compilation of resources related to the *Clarus* Initiative. The website contains a *Clarus* flier, frequently asked questions (with answers), briefings presented at past meetings of the *Clarus* Initiative Coordinating Committee (ICC), the *Clarus* Concept of Operations, project design documents, the status of state agency contributions to *Clarus*, information on the *Clarus* regional demonstrations, contacts, and related links. The website also links to the *Clarus* System software tool, which is currently available to the transportation community on an experimental basis.

Cost: Free

To Access This Resource: Access the website address
<http://www.clarusinitiative.org>.

http://

Maintenance Decision Support System (MDSS) Website

This site is the official website of the Maintenance Decision Support System (MDSS) project. The MDSS is a decision support tool that integrates relevant road weather forecasts, coded maintenance rules of practice, and maintenance resource data to provide winter maintenance managers with recommended road treatment strategies. The site contains an overview of the prototype, technical documents and program review materials, information on the most recent MDSS stakeholder meetings, contact information, and a link to the latest MDSS prototype software release.

Cost: Free

To Access This Resource: Access the website address
http://www.rap.ucar.edu/projects/rdwx_mdss.

http://

PIARC Technical Committee on Winter Maintenance (C3.4) Website

This site is the official website of the World Road Association (abbreviated "PIARC") Technical Committee on Winter Services (Technical Committee B.5 [TCB.5]). The website contains a synopsis of the committee's strategies and outputs, a calendar of

upcoming events, and a section where PIARC members can log in to restricted areas of the website. Among the committee's goals is to improve winter maintenance and operation information systems.

Cost: Free

To Access This Resource: Access the website address <http://www.piarc.org/en/technical-committees/committee-B.5.htm>.

[http://](#)

Standing International Road Weather Commission (SIRWEC) Website

This site is the official website of the Standing International Road Weather Commission (SIRWEC). The purpose of SIRWEC is to facilitate information exchange among meteorologists, weather forecasters, highway engineers, maintenance personnel, and others about improving the safety of travel in a variety of weather conditions. Users can join the commission using an online sign-up feature. The website contains an introduction, the group's constitution, levels of deployment of road weather information system (RWIS) infrastructure in 30 countries, a history of past SIRWEC conferences, information on the next biennial conference, a list of members, and related links.

Cost: Free

To Access This Resource: Access the website address <http://www.sirwec.org>.

[http://](#)

National Highway Visibility Website

Sponsored by the FHWA Highway Community exchange program, this website provides a forum for discussion of weather conditions affecting visibility, especially fog. To participate in the Web-enabled discussion, users must join the National Highway Visibility (NHV) Community of Practice (CoP) using "one click" access via the website. The website includes an archive of previous messages posted as part of the discussion, reference documents, and a directory of NHV CoP members.

Cost: Free

To Access This Resource: Access the website address

<http://knowledge.fhwa.dot.gov/cops/hcx.nsf/home?openform&Group=National%20Highway%20Visibility>.



Best Practices for Road Weather Management CD-ROM Version 2.0

This CD-ROM is a compilation of resources available to help traffic, emergency, and maintenance managers improve roadway operations under inclement weather conditions. The CD-ROM includes a searchable database of 30 case studies of successful techniques used in response to various weather threats, including fog, high winds, rain, snow, ice, flooding, tornadoes, hurricanes, and avalanches. Other resources contained on the CD-ROM include a searchable database of more than 200 road weather publications, an environmental sensor overview, and 39 statewide road condition websites and other online resources. New features in the Version 2.0 CD-ROM include a Web-based interface and feedback form.

Cost: Free

To Access This Resource: Access the website address

http://ops.fhwa.dot.gov/weather/mitigating_impacts/best_practices.htm. To order the CD-ROM, contact Lynette Goodwin, Noblis, (202) 488-3033, lynette.goodwin@noblis.org.



Clarus System

The *Clarus* System is a software tool currently available for use by the transportation community on an experimental basis. The *Clarus* System compiles and distributes weather observations from environmental sensor stations (ESSs) in 11 U.S. states and three Canadian provinces. Users can search the system's total population of ESSs by contributing agency or by geospatial coordinates (latitude and longitude). Data may be downloaded in several formats compatible with many common database management software systems. Users may choose to receive weather observations at 20-minute intervals from selected ESSs on a subscription basis. (The *Clarus* System generates a subscription-specific link on the <http://www.clarus-system.com> website.) This prototype

software has been made available to the transportation community for the purposes of demonstration, evaluation, and refinement of future versions of the software.

Cost: Free

To Access This Resource: Access the website address <http://www.clarus-system.com>.



Maintenance Decision Support System Version 5.0

The Maintenance Decision Support System (MDSS) assists transportation maintenance personnel in making winter maintenance decisions with regard to the type, timing, rates and locations of road treatments based on real-time weather observation data collected from a variety of sources. To aid in this decision support, MDSS generates diagnostic and prognostic maps of road conditions along road corridors, with emphasis on the 1- to 48-hour time horizon.

Cost: Free

To Access This Resource: Order MDSS through the National Center for Atmospheric Research's (NCAR) Research Applied Laboratory (RAL) by registering at the website address http://www.rap.ucar.edu/projects/rdwx_mdss/products/register.php.



Road Weather Resource Identification Tool, Version 2.0

This software tool is a searchable database of hundreds of resources relating to road weather management, including research reports, articles, and other publications. Users can search the database by keyword, selecting from a list of topics, or using a "guided search" that interacts with the user through a series of questions. Version 2.0 was expanded to include more than 650 documents.

Cost: Free

To Access This Resource: Access the website address <http://www.ops.fhwa.dot.gov/weather/rwri/registration.htm>. Free registration is required to download the software.



3rd National Surface Transportation Weather Symposium (3NSTWS) (2007)

This document provides a summary of the 3rd National Surface Transportation Weather Symposium (3NSTWS), held July 25-27, 2007, in Vienna, Virginia, and co-sponsored by the Federal Coordinator for Meteorological Services and Supporting Research (OFCM) and FHWA. The symposium provided a forum for representatives from three different aspects of surface transportation—operations, research, and users—to work together to improve road weather products and services. The goal of this collaboration and these improved products and services is to reduce crashes and delays caused by inclement weather. This document summarizes each of the plenary speeches and breakout group sessions. The document concludes with action items to be accomplished as follow-up to the meeting.

Cost: Free

To Access This Resource: Access the website address <http://www.ofcm.gov/wist/3NSTWSP-Summary-Report-Final.pdf>.



***Clarus*: A Clear Solution for Road Weather Information (2007)**

This flier describes the *Clarus* system as the 21st century's answer to the need for timely, high-quality road weather information. The flier describes *Clarus*' benefits for transportation managers, weather information providers, and the traveling public. The flier also includes perspectives of state department of transportation personnel who will benefit from the system's ability to standardize road weather data across multiple jurisdictions and multiple regions.

Cost: Free

To Access This Resource: To order a hardcopy, contact Paul Pisano, FHWA Office of Transportation Operations, (202) 366-1301, Paul.Pisano@dot.gov. For the online version, access the website address http://www.clarusinitiative.org/documents/Clarus_TRB_2007flyer_rev.pdf.



Communicating with the Public Using ATIS During Disasters—A Guide for Practitioners (FHWA-HOP-07-068) (2007)

This report documents the findings of a study on the dissemination of traveler information during disasters, both natural (e.g., hurricanes, earthquakes, avalanches, and fires) and man-made (e.g., hazardous material spills and terrorist attacks). The report explores what information needs to be communicated to evacuees and other travelers during disaster conditions and how Advanced Traveler Information Systems (ATIS) can be used to deliver such information most effectively. The use of ATIS during actual disasters in California, Georgia, Nevada, Utah, and Washington State is profiled in this report. The report presents a concept of operations that characterizes the flow of information among people, organizations, and technologies and recommends developing a local strategy for using ATIS during disasters. The report concludes with a toolkit for conducting a workshop among key stakeholders to develop such a strategy.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/publications/atis/atis_guidance.pdf
- HyperText Markup Language (HTML) format: <http://www.ops.fhwa.dot.gov/publications/atis/index.htm>



Empirical Studies on Traffic Flow in Inclement Weather (FHWA-HOP-07-073) (2007)

This report documents the findings of an evaluation of the impact of weather on traffic flow. That weather has an impact on traffic flow is obvious to both transportation professionals and lay people. However, until this evaluation, there had been limited use of traffic analysis tools to better understand and quantify the relationship between the two. Archived data on both traffic and weather from three metropolitan areas—Minneapolis-St. Paul, Minnesota; Baltimore, Maryland; and Seattle, Washington—were

analyzed using macroscopic simulation models. The study found that varying weather conditions had no impact on the density of traffic jams, but that rain and snow did impact free-flow speed, speed-at-capacity, and road capacity and that the degree of impact was directly proportional to the intensity of precipitation. The report concludes with recommendations for future research.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://www.ops.fhwa.dot.gov/publications/weatherempirical/weatherempirical.pdf>
- HyperText Markup Language (HTML) format: <http://www.ops.fhwa.dot.gov/publications/weatherempirical/index.htm>



Weather Applications and Products Enabled through Vehicle Infrastructure Integration (VII): Feasibility and Concept Development Study (FHWA-HOP-07-084) (2007)

Vehicle Infrastructure Integration (VII) involves two-way wireless transmission of data from vehicles to other vehicles and from vehicles to the roadside. If implemented nationwide, VII has the potential to make enormous amounts of data available to many different types of ITS applications, including road weather applications. This report assesses the feasibility of using VII-enabled data to enhance road weather products and services. The report inventories what weather data elements are already available on board most vehicles, such as temperature, humidity, precipitation, and light level. The report provides an analysis of existing road weather products and services that could be enhanced by vehicle-based weather data, as well as entirely new products and services that these data could make possible. The report presents the results of a case study from Detroit, Michigan that evaluated the accuracy of on-board data elements as compared with data from conventional weather monitoring equipment. The report concludes with recommendations for future research.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://www.ops.fhwa.dot.gov/publications/viirpt/viirpt.pdf>
- HyperText Markup Language (HTML) format: <http://www.ops.fhwa.dot.gov/publications/viirpt/index.htm>



Integration of Emergency and Weather Elements into Transportation Management Centers (FHWA-HOP-06-090) (2006)

This report documents the findings of a study that examined how weather and emergency information is being integrated into operations at 38 transportation management centers (TMCs) across the country. The study was sponsored jointly by the FHWA Road Weather Management Program and the FHWA Emergency Transportation Operations Program. The report describes the state-of-the-practice in integration of weather and emergency information into TMC operations. The report also identifies best practices, discusses the benefits and challenges of integration, and offers recommendations on how to get started and how to enhance current weather/emergency integration at one's own TMC.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://www.ops.fhwa.dot.gov/weather/resources/publications/tcmintegration/finalrpttmc22806.pdf>
- HyperText Markup Language (HTML) format: <http://www.ops.fhwa.dot.gov/weather/resources/publications/tcmintegration/index.htm>



Prototype Weather Response System (WRS) for Transportation Operations (FHWA-HOP-06-106) (2006)

This flier provides an overview of an effort by the FHWA and the Missouri Department of Transportation to develop a prototype online software tool called Weather Response System (WRS).

The WRS supports transportation systems management, operations, and maintenance prior to and during weather events. The flier presents the purposes, objectives, and features of the WRS. The flier concludes with a brief description of a three-month real-world test of the WRS and the planned enhancements that were identified during this test.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://www.ops.fhwa.dot.gov/publications/wrs/wrsflyernov06.pdf>
- HyperText Markup Language (HTML) format: <http://www.ops.fhwa.dot.gov/publications/wrs/index.htm>



The Maintenance Decision Support System (FHWA-HOP-05-061) (2005)

This flier provides an overview of an effort by the FHWA and its partners to develop a Maintenance Decision Support System (MDSS) prototype. The flier explains what an MDSS is, what is innovative about it, what the benefits are to maintenance supervisors at the state department of transportation level, where one can obtain MDSS documents and software, and what the next steps are in the development process.

Cost: Free

To Access This Resource: Contact Paul Pisano, FHWA Office of Transportation Operations, (202) 366-1301, Paul.Pisano@dot.gov.



Road Weather Information System Environmental Sensor Station Siting Guidelines (FHWA-HOP-05-026) (2005)

This document provides guidelines for siting a Road Weather Information System (RWIS) Environmental Sensor Station (ESS) and its associated atmospheric and pavement sensors. The guidelines are intended to help establish uniformity in siting ESSs and to improve the usefulness of road weather information derived from ESS observations. The steps in the siting process include assessment of road weather information requirements,

site selection, sensor location, scheduling periodic site review, and consideration of additional factors, such as power, communications, aesthetics, safety and security.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://www.ops.fhwa.dot.gov/publications/ess05/ess05.pdf>
- HyperText Markup Language (HTML) format: <http://www.ops.fhwa.dot.gov/publications/ess05/index.htm>



Road Weather Management Product Guide (FHWA-HOP-05-057) (2005)

This flier profiles several resources that are products of the FHWA Office of Operations' Road Weather Management Program (RWMP). The flier profiles available training, software tools, project fliers, reports, and other publications.

Cost: Free

To Access This Resource: Contact Paul Pisano, FHWA Office of Transportation Operations, (202) 366-1301, Paul.Pisano@dot.gov.



Winter Highway Operations: A Synthesis of Highway Practice (NCHRP Synthesis# 344) (2005)

This report is an update to a 1994 NCHRP Synthesis report on managing roadway snow and ice control operations. This report, compiled through surveys sent to representatives of 71 transportation agencies in the U.S. and Canada, presents the state-of-the-practice on winter highway operations. The report assesses the current state-of-the-practice, covering such issues as snow and ice control strategies, budgeting and performance measures, plow routes and material application decisions, storm clean-up, decision support, information management, operations, traditional technologies, and Road Weather Information Systems (RWIS). The report also addresses agencies' environmental responsibilities, institutional and workforce issues, emerging technologies, and directions for future research.

Cost: \$17 for the hardcopy version; the online version is free.

To Access This Resource: To order the hardcopy version, contact the Transportation Research Board (TRB) Bookstore at <http://www.trb.org/bookstore> and search for “SYH344,” (202) 334-3213, fax: (202) 334-2519. For the online version, access the website address http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_344.pdf.



Collaborative Research on Road Weather Observations and Predictions by Universities, State Departments of Transportation, and National Weather Service Forecast Offices (2004)

From 2001 to 2003, the FHWA Road Weather Management program partnered with the National Weather Service to conduct five research projects through the Cooperative Program for Operational Meteorology, Education and Training (COMET). The purpose of these projects was to evaluate the use of weather observations and modeling to improve highway safety and support effective decisions made by the various jurisdictions that manage the highway system. These projects involved partnerships among the National Weather Service (NWS), Weather Forecast Offices (WFOs), state departments of transportation, and universities. A report documents the findings of the research projects. A brochure summarizes the findings and presents lessons learned.

Cost: Free

To Access This Resource: Access the following website addresses:

- Brochure (FHWA-HRT-04-101)—Adobe Acrobat format:
<http://www.tfhr.gov/its/pubs/04101/04101.pdf>
- Brochure—HyperText Markup Language (HTML) format:
<http://www.tfhr.gov/its/pubs/04101/index.htm>
- Report (FHWA-HRT-04-109)—Adobe Acrobat format:
<http://www.tfhr.gov/its/pubs/04109/04109.pdf>
- Report—HyperText Markup Language format:
<http://www.tfhr.gov/its/pubs/04109/index.htm>



Weather and ITS (2004)

Published jointly by FHWA, the American Meteorological Society (AMS) and the Intelligent Transportation Society of America (ITS America), this brochure examines both the present and future use of surface transportation weather information in traveler information, as well as transportation systems operations and maintenance. The brochure lists resource documents, websites and points-of-contact at FHWA, AMS, and ITS America.

Cost: Free

To Access This Resource: Access the website address http://www.itsa.org/itsa/files/pdf/Weather_ITS_brochure.pdf.



Where Weather Meets the Road: A Research Agenda for Improving Road Weather Services (2004)

This document outlines a research agenda for improving road weather services in the U.S., and recommends that FHWA take the lead in creating a coordinated national road weather research program. The program's main objective would be to bring together the weather and transportation communities to maximize the use of available information and technologies, identify and support research priorities, and effectively implement new scientific and technological advances. Recommended next steps are to establish regional research centers and create national demonstration corridors to showcase the effectiveness of road weather improvements.

Cost: \$37 for the hardcopy version; \$31.50 for the online version; \$48 for both.

To Access This Resource: Contact National Academies Press, (800) 624-6242, <http://www.nap.edu>.



Environmental Sensor Stations (ESS) ITS Standards Advisory (2003)

This flier is one of a series of documents that provide state and local transportation agencies with background and guidance on development issues and other key activities related to ITS

standards. This flier provides an update on recent developments concerning standards for environmental sensor stations within the National Transportation Communications for ITS Protocol (NTCIP) family of ITS standards. An initial version of the NTCIP standard for environmental sensor stations—NTCIP 1204—was published in 1998. The flier contains case studies on the use of NTCIP 1204 in Minnesota, Washington, and Wisconsin; a list of contacts; and a bibliography.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.standards.its.dot.gov/Documents/advisories/ess_advisory.pdf
- HyperText Markup Language (HTML) format: http://www.standards.its.dot.gov/Documents/advisories/ess_advisory.htm



Intelligent Transportation Systems and Winter Operations in Japan (FHWA-PL-03-016) (2003)

This report documents the findings of a 2003 scanning tour of Hokkaido, Japan, to investigate the use of advanced technologies for winter maintenance operations and implementation of those advances in Japan's ITS architecture. The report presents the scanning team's recommendations for application of Japan's techniques in the U.S., including testing several advanced winter maintenance vehicle systems, investigating integration of weather-related information into ITS corridors, developing performance-based standards for winter maintenance, and establishing a data-sharing project involving the National Weather Service and transportation agencies.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://international.fhwa.dot.gov/Pdfs/converted_to_html/scanreports/intelligent/japan_winterops.pdf
- HyperText Markup Language (HTML) format: http://international.fhwa.dot.gov/Pdfs/converted_to_html/scanreports/intelligent/intelligentmain.htm



Proceedings of the Workshop on Strategy for Providing Atmospheric Information (2002)

This document is a compilation of presentations given at the Workshop on Strategy for Providing Atmospheric Information, held December 3-5, 2001, in Arlington, Virginia and sponsored by the Office of the Federal Coordinator of Meteorology's (OFCM) Joint Action Group for Weather Information for Surface Transportation (JAG/WIST). The goal of the workshop was to consider how best to take advantage of the considerable investments in weather observation technology that have already been made on a national scale.

Cost: Free

To Access This Resource: Access the website address http://www.ofcm.gov/sai/presentations/sai_linking_file.htm.



Weather Information for Surface Transportation (WIST): National Needs Assessment Report (2002)

Published by the Office of the Federal Coordinator for Meteorological Services and Supporting Research (OFCM), part of the National Oceanic and Atmospheric Administration (NOAA), this report compiles and analyzes weather information needs for selected surface transportation sectors. The report draws conclusions that are common to roadway, railway, transit, and marine transportation, pipeline systems, and airport ground operations. In addition, the report suggests next steps for a broadly coordinated weather information for surface transportation (WIST) initiative.

Cost: Free

To Access This Resource: Access the website address http://www.ofcm.gov/wist_report/wist-report.htm.



National Review of Hurricane Evacuation Plans and Policies (2001)

This report documents the findings of a review of state departments of transportation hurricane evacuation policies and strategies. This report includes information on the application of evacuation strategies and technologies, such as the use of lane reversal (contraflow) operations and ITS. The report also summarizes current evacuation management policies, methods of information exchange, and decision-making criteria.

Cost: Free

To Access This Resource: Access the website address <http://www.hurricane.lsu.edu/%26EvacuationReview.pdf>.



Proceedings of the Weather Information for Surface Transportation (WIST) Forum (2001)

This document provides a summary of the Weather Information for Surface Transportation (WIST) Forum, held December 4-6, 2000, in Rockville, Maryland, and sponsored by the Office of the Federal Coordinator of Meteorology's (OFCM) Joint Action Group for Weather Information for Surface Transportation (JAG/WIST). The goal of the forum was to improve the weather information that is available to decision-makers. The proceedings summarize each of the plenary speeches, breakout group sessions, and closing remarks, and link to the presentations given at the forum where available.

Cost: Free

To Access This Resource: Access the website address <http://www.ofcm.gov/wist2/proceedings2000/wist2startup.htm>. To order a hardcopy, contact Paul Pisano, FHWA Office of Transportation Operations, (202) 366-1301, Paul.Pisano@dot.gov.



Surface Transportation Weather Decision Support Requirements (1999-2000)

This series of documents presents the findings of the Surface Transportation Weather Decision Support Requirements (STWDSR) project. STWDSR Draft Version 1.0 documents the weather information requirements of all road operators, maintainers, and users. STWDSR Draft Version 2.0 focuses on the decision support requirements of a particular stakeholder group—winter road maintenance engineers. It also presents an operational concept for a Weather Information for Surface Transportation Decision Support System (WIST-DSS).

Cost: Free

To Access This Resource: Access the following website addresses:

- Draft Version 1.0: Executive Summary (1999): http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/11823.pdf, EDL# 11823
- Draft Version 1.0: Full Report (2000): http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/12144.pdf, EDL# 12144
- Draft Version 1.0: User Needs and Appendices (2000): http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/12143.pdf, EDL# 12143
- Draft Version 2.0: Operational Concept Definition (2000): http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13134.pdf, EDL# 13134
- Draft Version 2.0: Preliminary Interface Requirements (2000): http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13242.pdf, EDL# 13242



Saving Lives, Improving Transportation Efficiency—Weather Information for Surface Transportation (FHWA-JPO-99-015) (1999)

This brochure, one in a series designed to encourage decision-makers to invest their own budget resources in ITS, examines the safety and travel efficiency benefits of weather information for surface transportation (WIST) systems. The brochure quotes from

road maintenance departments, transit agencies, and everyday motorists about the benefits they have experienced from using these systems.

Cost: Free

To Access This Resource: Access the website address <http://www.itsdocs.fhwa.dot.gov/jpodocs/brochure/6863.pdf>.



Road Risk (FHWA-HOP-05-024) (2005)

This 21-minute video explores the effects of weather on highway operations and the existing and emerging solutions being implemented to improve mobility, safety, and productivity. The video discusses ongoing efforts to improve operations, and focuses on operations under severe weather conditions and the role of ITS. The video highlights several technology solutions, including low visibility warning systems, maintenance decision support systems, and 511.

Cost: Free

To Access This Resource: To order a copy of the video, contact Paul Pisano, FHWA Office of Transportation Operations, (202) 366-1301, Paul.Pisano@dot.gov.



Principles and Tools for Road Weather Management (NHI Course# 137030)

This course helps those involved in highway maintenance and operations develop techniques and strategies for tackling road weather problems. This course provides basic knowledge of meteorology and addresses the technological resources available to support highway personnel in making effective road weather management decisions. Key topics covered in the course include the impacts of weather on highway operations, fundamentals of meteorology including how it pertains to Road Weather Information Systems (RWIS), technical and institutional resources available for implementing RWIS, and a range of effective and open solutions to various types of road weather conditions and for various management practices. The course focuses heavily on resources and solutions and how the solutions can reduce the impact of adverse weather on the traveling public and the highway agency. Target Audience: Transportation engineers,

planners, managers, public works personnel, safety engineers, systems engineers, operators, maintenance personnel and emergency personnel. Course Length: One day

Cost: \$200 per participant

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137030."



Anti-Icing/RWIS Computer-Based Training

This course is a self-paced, interactive, multi-media computer-based training (CBT) course that instructs students on the use of Road Weather Information Systems (RWIS) and anti-icing techniques. After completing the introductory lessons, students put their knowledge into practice in the Scenario Room in which students battle winter events with tools available in a simulated winter maintenance facility.

Cost: \$400 for members of the American Public Works Association (APWA); \$500 for non-members.

To Access This Resource: Contact the APWA Bookstore, <http://www.apwa.net/bookstore/detail.asp?PC=PB.X407>, (800) 848-2792, fax: (816) 472-1610.



Fundamentals of Road Weather Management CD-ROM: Professional Development Module

This professional development module was developed by FHWA in partnership with the Institute of Transportation Engineers (ITE) to provide transportation practitioners with a quick, concise, and easy way to learn the basics of road weather management. The CD-ROM provides general information about the scope of the road weather problem, the types of management strategies that can be used, the technologies available to support road weather management, and actions that can be taken to address road weather incidents. The CD-ROM also presents best practices in road weather management. The module includes a PowerPoint presentation that takes about an hour to complete, as well as a supplemental guide.

Cost: \$75 for ITE members; \$100 for non-members.

To Access This Resource: Contact the ITE Bookstore, <http://www.ite.org/bookstore/index.asp>, (202) 289-0222 x130, fax: (202) 289-7722, publications@ite.org.



Maintenance Decision Support System (MDSS) Roadshow

The Maintenance Decision Support System (MDSS) Roadshow presents an overview of MDSS – a system that advises winter maintenance managers on where to deploy what resources (such as snow plows) based on current weather conditions. A 30-minute Executive Briefing describes what MDSS is, how it works, and the benefits (in terms of cost savings and more effective maintenance) that MDSS can achieve. A three-hour Shop Session covers all the material in the Executive Briefing, but also goes into more detail about MDSS functionality. In addition, a case study from Iowa, the MDSS Pooled Fund Study Program, and a list of MDSS vendors are presented in the Shop Session.

Cost: Free

To Access This Resource: Access the website address http://ops.fhwa.dot.gov/weather/seminars/mdss_roadshow or contact Ray Murphy of the FHWA Resource Center, (708) 283-3517, Ray.Murphy@dot.gov.



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- Ray Murphy, FHWA Resource Center, (708) 283-3517, Ray.Murphy@dot.gov
- Frank Corrado, Federal Lands Highway Division, (703) 404-6372, Frank.Corrado@dot.gov
- Aletha Goodine, FTA Office of Mobility Innovation, (202) 366-6678, Aletha.Goodine@dot.gov



Rural ITS Section of the FHWA Office of Operations Website

This website is a compilation of resources related to the use of ITS technologies in rural and statewide transportation. The website contains announcements of upcoming events, resource documents, presentations, and related links.

Cost: Free

To Access This Resource: Access the website address http://www.ops.fhwa.dot.gov/int_its_deployment/rural/rural.htm.



The U.S. Department of Transportation Rural Safety Initiative (2008)

This document lays out a plan for the U.S. DOT's Rural Safety Initiative. This plan describes existing and new initiatives undertaken by several U.S. DOT agencies—FHWA, FMCSA,

NHTSA, RITA, and the Pipeline and Hazardous Materials Safety Administration (PHMSA)—to improve traffic safety on rural roads. New initiatives include testing ignition interlocks to encourage seat belt use (NHTSA), encouraging states to take full advantage of the High Risk Rural Roads funding program (FHWA), issuing guidance to help prevent truck fatalities in work zones (FMCSA), and reactivating previously inactive Local Emergency Preparedness Committees (PHMSA). Through the ITS Joint Program Office, RITA will make \$6 million available for partnerships with rural communities to test and expedite the deployment of ITS technologies for rural safety, including intersection- and vehicle-based collision avoidance systems; lane departure warning systems; variable speed limits; dynamic curve warning systems; road weather information systems; the Next Generation 9-1-1 Initiative; and real-time traveler information services about traffic, weather, and navigation.

Cost: Free

To Access This Resource: Access the website address <http://www.dot.gov/affairs/ruralsafety/ruralsafetyinitiativeplan.htm>.



Traveler Information and Tourism: Assessment of Traveler Information and 511 Impacts upon Tourist Destinations and National Parks (2004)

This report documents the findings of a study that examined the impact of traveler information on four tourist areas: Acadia National Park in Maine; Branson, Missouri; the I-81 Corridor in the Shenandoah Valley of Virginia; and Salt Lake City, Utah. The report examines the impacts of traveler information at each of the four sites in depth, and then concludes with cross-cutting findings and recommendations on how to improve traveler information operations in tourist areas.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14054_files/14054.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14054.htm, EDL# 14504



Low-Cost Traffic Engineering Improvements: A Primer (FHWA-OP-03-078) (2003)

This report provides a basic introduction to low-cost traffic engineering improvements, defining “low-cost” as between \$10,000 and \$50,000. The report discusses dozens of low-cost improvements, including alteration of traffic signal timing, installation of supplemental signage and traffic signal equipment, replacement of less restrictive traffic control devices with more restrictive ones (e.g., replacement of “Yield” signs with “Stop” signs), and the creation or alteration of lanes through re-striping. The report presents case studies from Maryland, Michigan, Missouri, Oregon, Pennsylvania, and Virginia and shows what low-cost improvements were tried in these areas and what benefits the agencies experienced as a result. The report contains a short section specifically addressing low-cost improvements for rural roads.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/publications/low_cost_traf/low_cost_traf.pdf
- HyperText Markup Language (HTML) format: http://www.ops.fhwa.dot.gov/publications/low_cost_traf/index.htm



Best Practices of Rural and Statewide ITS Strategic Planning (FHWA-OP-02-037) (2002)

This report documents best practices in rural and statewide ITS planning and presents an overview of the “typical” ITS strategic planning process. This report contains 30 examples of ITS rural and statewide strategic planning (12 in-depth case studies and 18 interview summaries). In addition, this report documents the benefits of rural and statewide ITS strategic planning, in order to encourage future planning efforts in other locations.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13608.pdf, EDL# 13608.



Safety Applications of ITS in Rural Areas (FHWA-OP-02-038) (2002)

This report examines current, past, and planned infrastructure-based technology applications aimed at reducing the frequency and/or severity of crashes in rural areas. The report focuses on variable speed limit (VSL) systems and safety warning systems (SWs), although a range of technology applications is addressed in the report.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13609.html.



Small Communities’ Benefits: Innovative Traffic Management Practices in Small Communities (FHWA-OP-02-033) (2002)

This document profiles five small communities that have been adept at finding traffic management solutions that address their needs and at the same time match their financial and human resources. The five communities encompass a range of population sizes, traffic management solution types, and geographic locations.

Cost: Free

To Access This Resource: Access the website address
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13612.html.



Rural ITS Toolbox (FHWA-OP-01-030) (2001)

This report profiles over 50 successful rural and statewide ITS applications from across the U.S. For each application, the report provides a description, transportation needs addressed by the application, expected benefits, lessons learned from previous deployments, opportunities for integration with other ITS systems, and institutional and implementation issues that may be encountered when attempting to deploy the system. Each profile also includes a real-world example of this type of application in action.

Cost: Free

To Access This Resource: Access the website address
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13477.html, EDL# 13477.



Serving Rural America (FHWA-EP-01-033) (2001)

This guide provides information about the U.S. Department of Transportation's grant programs that are of direct interest to rural areas and small communities. Published by the FHWA Office of Planning and Environment, the guide also includes a brief discussion of programs that address transportation problems that both rural and urban areas typically face.

Cost: Free

To Access This Resource: To order a hardcopy, contact David Kuehn, FHWA Office of Planning, (202) 366-6072, David.Kuehn@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: <http://www.fhwa.dot.gov/planning/rural/ruralamerica/ruralfinal-nu2.pdf>
- HyperText Markup Language (HTML) format: <http://www.fhwa.dot.gov/planning/rural/ruralamerica/index.html>



National Parks: Transportation Alternatives and Advanced Technology for the 21st Century (1999)

This report documents the findings of the workshop on National Parks: Transportation Alternatives and Advanced Technology for the 21st Century that was held June 3-5, 1999, in Big Sky, Montana. The number of visitors to National Parks in the U.S. is expected to increase fivefold in the next 40 years. Meanwhile, the National Park Service (NPS) is expected to provide increased services with fewer resources and simultaneously to protect the parks' environment for future generations. Workshop participants explored how the use of advanced transportation technologies can help the NPS meet these formidable challenges.

Cost: Free

To Access This Resource: Access the website address <http://www.itsdocs.fhwa.dot.gov/jpodocs/proceedn/11803.pdf>, EDL# 11803.



Rural ITS User Needs (1999)

This document articulates a comprehensive list of rural ITS user needs that can be used to identify rural travel requirements and to guide rural ITS deployments. The needs identified in this document serve as the basis for definition of a rural ITS infrastructure, for update of the *Rural ITS Program Plan*, and for maintenance of the National ITS Architecture.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/10063.pdf, EDL# 10063.



Technology in Rural Transportation: "Simple Solutions" (FHWA-RD-97-108) (1997)

This report profiles more than 50 proven, cost-effective, "low-tech" solutions to problems in rural transportation. For each solution, the report provides a description of the "low-tech"

approach, the goals of the system and whether or not the goals have been achieved, current status and projected schedule for the future, location or geographic scope, agencies involved, project costs (if available), and contact information.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/3144.pdf.



Rural ITS Toolbox (NHI Course# 137007)

This course describes many ITS-related practices and techniques that have been applied successfully to rural transportation problems, which are described in the *Rural ITS Toolbox* document. The training course goes into further detail by including problem solving techniques and training for the course participant to describe ITS technologies to their stakeholders. This course will help participants identify cost-effective ITS technologies that can address rural transportation problems. Skill Level: Core learning. Target Audience: County, municipal, and town executives; traffic engineers; state, Federal, and local transportation planners and operations personnel; motor carrier managers; environmental groups; information technology (IT) personnel; academia; consultants; and contractors. Course Length: Eight hours.

Cost: \$200 per participant

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number “137007.”



Integrated Transportation Management for Small- and Medium-Sized Communities (NHI Course# 137043)

This course introduces the use of Advanced Transportation Management Systems (ATMS) and Advanced Traveler Information Systems (ATIS) when deployed in small and medium-sized communities. This course provides participants with the basic knowledge and resources needed to begin the process of planning for ATMS and ATIS in small and medium-sized communities. Target Audience: Transportation professionals

involved in the planning, design, implementation, and operation of ITS in small and medium-sized communities. Course Length: One day.

Cost: \$200 per participant

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137043."



Tolling and Pricing Point-of-Contact

- Brian Cronin, ITS Joint Program Office, (202) 366-8841, Brian.Cronin@dot.gov
- Wayne Berman, FHWA Office of Transportation Management, (202) 366-4069, Wayne.Berman@dot.gov
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<http://>

Tolling and Pricing Opportunities Section of the FHWA Office of Operations Website

This website is a compilation of information about FHWA tolling and pricing programs. With the enactment of Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) in 2005, Title 23 of the U.S. Code (USC) was revised to contain several new provisions for tolling and pricing. The website contains a solicitation for expressions of interest from states and other public entities to participate in new tolling programs available under Title 23 USC. Those interested can respond to the solicitation directly through the website. The website also contains presentations, fact sheets, articles, reports, white papers, Federal guidance, points-of-contact, and related links.

Cost: Free

To Access This Resource: Access the website address http://www.ops.fhwa.dot.gov/tolling_pricing/index.htm.

<http://>

ValuePricing.org Website

This site, co-sponsored by the Minnesota Department of Transportation and the University of Minnesota's Hubert H. Humphrey Institute of Public Affairs, is a compilation of materials related to value pricing. The website contains a tutorial on value pricing, including a definition, examination of the different kinds of pricing, a draft information kit, and glossary. The website lists value pricing projects in the U.S., including established projects and those in the demonstration stage. Through the website, users can download reports, workshop proceedings, project work

plans, and a promotional video. The website also supports a value pricing online discussion group.

Cost: Free

To Access This Resource: Access the website address

http://www.hhh.umn.edu/centers/slp/vp/vp_org.

[http://](#)

Moving the American Economy: National Strategy to Reduce Congestion Website

This website is a compilation of resources related to the U.S. Department of Transportation's Congestion Initiative, a six-part national strategy to reduce congestion on the country's roads, in its airspace and at its intermodal ports. The website contains the current status of U.S. DOT solicitations related to the Congestion Initiative, including those for urban partnership agreements, participation in a value pricing pilot program, and an ITS operational test. The website also contains helpful resources, including documents, presentations, and related links. Documents posted on the site include the May 2006 report *National Strategy to Reduce Congestion on America's Transportation Network*, which outlines the U.S. DOT's six-part congestion reduction plan.

Cost: Free

To Access This Resource: Access the website address

<http://www.fightgridlocknow.gov>.

[http://](#)

Transportation Research Board Committee ABE25 on Congestion Pricing Website

This is the official site of the Transportation Research Board (TRB) Committee ABE25 on Congestion Pricing. The site contains the committee's mission statement, membership list, list of subcommittees, minutes of committee meetings, and presentations given at committee-sponsored sessions at the 87th TRB Annual Meeting held in Washington, D.C., in January 2008. The site also contains materials related to the broader topic of congestion pricing, such as a compilation of news articles on

congestion pricing, information on the locations for pilot tests of congestion pricing to be conducted under the U.S. DOT's Urban Partnerships program, a calendar of upcoming events, and related links.

Cost: Free

To Access This Resource: Access the website address <http://www.trb-pricing.org>.



Congestion Pricing: A Primer (FHWA-HOP-07-074) (2006)

This primer presents an overview of congestion pricing as an effective tool to address the growing congestion problem in the U.S. The primer defines congestion pricing and discusses its benefits, then highlights examples of congestion pricing from both the U.S. and elsewhere. The primer discusses Federal policies and programs that affect congestion pricing and concludes with a list of frequently asked questions (with answers).

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://www.ops.fhwa.dot.gov/publications/congestionpricing/congestionpricing.pdf>
- HyperText Markup Language (HTML) format: <http://www.ops.fhwa.dot.gov/publications/congestionpricing/index.htm>



A Guide for HOT Lane Development (FHWA-OP-03-009) (2003)

This guide provides information on a wide range of policy and technical issues associated with high-occupancy toll (HOT) lanes, focusing on how these activities are likely to differ from those associated with more traditional highway improvements. This guide includes case studies of the four existing HOT lane facilities in the U.S., as well as two recent HOT lane studies that are indicative of current trends.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13668_files/images/13668.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13668.html, EDL# 13668



Automated Vehicle Identification Tags in San Antonio: Lessons Learned from the Metropolitan Model Deployment Initiative (FHWA-OP-01-037) (2001)

This is one in a series that documents lessons learned from the Metropolitan Model Deployment Initiative (MMDI). This report documents the benefits of integration of electronic toll collection and traffic management.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13230_files/13230.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13230.html, EDL# 13230



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- Chung Tran, FHWA Resource Center, (720) 963-3233, Chung.Tran@dot.gov

<http://>

Traffic Incident Management Section of the FHWA Office of Operations Website

This website is a compilation of resources related to traffic incident management. This website contains press releases, resource documents, and a schedule of upcoming meetings of groups that focus on traffic incident management, such as the Institute for Electrical and Electronics Engineers (IEEE) Incident Management Working Group.

Cost: Free

To Access This Resource: Access the website address <http://www.ops.fhwa.dot.gov/incidentmgmt/index.htm>.

<http://>

Planned Special Events Traffic Management Section of the FHWA Office of Operations Website

This website is a compilation of resources related to traffic management for planned special events. The website explains what planned special events are—including sporting events,

concerts, festivals, conventions and political protests—and why managing traffic before, during, and after them is so important. The website contains key documents, including the handbook *Managing Travel for Planned Special Events*, and announcements of important upcoming events such as the biannual National Conference on Managing Travel for Planned Special Events.

Cost: Free

To Access This Resource: Access the website address http://www.ops.fhwa.dot.gov/program_areas/sp-evnts-mgmt.htm.

[http://](#)

National Traffic Incident Management Coalition (NTIMC) Website

This website is the official website for the National Traffic Incident Management Coalition (NTIMC), a forum where major stakeholders involved in traffic incident management (TIM) work together to advance best practices. The website contains the NTIMC newsletter, a calendar of upcoming events, a membership roster, and other resources. On March 1, 2007, the NTIMC released its proposed National Unified Goal (NUG) for Traffic Incident Management. The website has the full text of the NUG, a NUG fact sheet, a presentation with accompanying text that describes the NUG, and other materials.

Cost: Free

To Access This Resource: Access the website address <http://www.timcoalition.org>.

[http://](#)

Managing Travel for Planned Special Events Section of the TMC Pooled-Fund Study Website

This website is a compilation of resources related to traffic management for planned special events assembled as part of the Traffic Management Center (TMC) Pooled-Fund Study. The TMC Pooled-Fund Study is a joint effort by FHWA and several state departments of transportation to advance both state-of-the-art and state-of-the-practice of several aspects of transportation operations. The website contains links to key documents, including the *Managing Travel for Planned Special Events* series

of documents and the NCHRP Synthesis report *Transportation Planning and Management for Special Events*, as well as examples of planned special event traffic management documents from several states and local agencies.

Cost: Free

To Access This Resource: Access the website address http://tmcpfs.ops.fhwa.dot.gov/cfprojects/new_detail.cfm?id=59&new=2.



Planned Special Events: Checklists for Practitioners

This tool is a series of six checklists that outline the steps for managing traffic before, during, and after planned special events. The steps outlined in these checklists are based on Chapters 4 through 10 of the handbook *Managing Travel for Planned Special Events*. Each step incorporates several assessments designed to address the effects that planned special events may have on traffic, parking, pedestrian access, and transit operations. The assessments include consideration of such factors as travel demand, road capacity, site capacity, event operation, and available resources.

Cost: Free

To Access This Resource: Access the website address <http://www.ops.fhwa.dot.gov/publications/psechecklists/index.htm>.



Intelligent Transportation Systems for Traffic Incident Management: Deployment Benefits and Lessons Learned (FHWA-JPO-07-001) (2007)

This leaflet is one in a series that shows how ITS technologies can reduce congestion, in support of the U.S. Department of Transportation's Congestion Initiative. This leaflet summarizes the benefits, costs, extent of deployment, and lessons learned from the use of ITS for traffic incident management. The online version contains a full list of sources, so that all information in the leaflet's brief four pages is backed up with supporting documentation.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS HelpLine, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.its.dot.gov/jpodocs/repts_te/14288_files/14288.pdf
- HyperText Markup Language (HTML) format: http://www.its.dot.gov/jpodocs/repts_te/14288.htm, EDL# 14288



Tabletop Exercise Instructions for Planned Events and Unplanned Incidents/Emergencies FHWA-HOP-08-005) (2007)

This document provides instructions on how to conduct a tabletop exercise that tests a regional transportation system's ability to handle extraordinary situations, such as planned special events and unplanned incidents and emergencies. In a tabletop exercise, participants role play in well-defined scenarios, enabling participants to identify unintended effects, vet and resolve conflicts, and familiarize themselves with their own roles in a transportation management plan. The document outlines roles and responsibilities of each type of participant, including transportation agencies, transit agencies, police/law enforcement, fire and rescue, emergency medical services, emergency management, towing and recovery, representatives of various venues (e.g., areas, stadiums, etc.), event organizers, and mayors' and governors' offices. The document describes 11 objectives that can be the focus of a tabletop exercise and recommends that each exercise focus on between six to eight objectives.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/publications/tabletopexercpe/tabletopexererc_pse.pdf
- HyperText Markup Language (HTML) format: <http://www.ops.fhwa.dot.gov/publications/tabletopexercpe/index.htm>



Coordinated Freeway and Arterial Operations Handbook (FHWA-HRT-06-095) (2006)

This handbook provides direction, guidance and recommendations on how to coordinate freeway and arterial operations in a proactive and comprehensive manner. The handbook defines coordinated freeway and arterial (CFA) operations and discusses how to apply CFA to four areas of high pay-off: traffic incident management, work zone management, planned special events management, and day-to-day (or recurring) operations. The handbook concludes with a discussion of new technologies such as ITS and an example of CFA in an incident management program in Northern Virginia. Development of this handbook was sponsored by the Transportation Management Center Pooled-Fund Study (TMC PFS).

Cost: Free

To Access This Resource: Access the website address http://tmc pfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/06095.pdf.



Simplified Guide to the Incident Command System for Transportation Professionals (FHWA-HOP-06-004/FHWA-NHI-06-007) (2006)

This guide provides an introduction to the Incident Command System, a systematic tool used for the command, control, and coordination of emergency response. ICS allows agencies to work together using common terminology and operating procedures for controlling personnel, facilities, equipment, and communications at a single incident scene. ICS is part of a broader incident management system as outlined in the Department of Homeland Security's National Incident Management System (NIMS). Topics covered in the guide include ICS organizational structure, characteristics of unified command, strategies and tools that support the development of an ICS framework for day-to-day highway incident management, considerations for the on-scene management of highway incidents, and the benefits of ICS. The guide also summarizes NIMS requirements for resource management, communications, and information management.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/publications/ics_guide/ics_guide.pdf
- HyperText Markup Language (HTML) format: http://www.ops.fhwa.dot.gov/publications/ics_guide/index.htm



Managing Travel for Planned Special Events: First National Conference Proceedings (FHWA-OP-05-017) (2005)

This document provides a summary of the first national conference on planned special events, held December 1-3, 2004 in New Orleans, Louisiana. The proceedings summarize the presentations from both the plenary and breakout sessions. The breakout sessions were organized into eight tracks: regional planning and coordination, event-specific operations planning, traffic management and security plans for stadiums and arenas, ITS support and applications, traffic management plans, transit and travel demand management, security and contingency planning, and traffic management team day-of-event activities.

Cost: Free

To Access This Resource: Access the website address http://www.ops.fhwa.dot.gov/program_areas/conf1204/index.htm.



IMS Model Procedures Guide for Highway Incidents (Item# 36612) (2004)

Developed by the National Fire Service (NFS) Incident Management Service Consortium, this model procedures guide applies the more general principles of incident management systems (IMS) to highway traffic incidents. The IMS principles were developed by the NFS to deal with a wide range of incidents, including structure fires or collapses, emergency medical services incidents, wildfires, and hazardous material spills. The purpose of the guide is to help the types of organizations involved in highway incidents—including law enforcement, fire and rescue, emergency medical services, hazardous material response,

traffic management, repair and maintenance, utilities, towing and recovery, public works, and motorist assistance—work together in a well-coordinated and unified fashion. This model procedures guide can serve as the initial design document from which organizations in a given region may build joint operating procedures. The document emphasizes using IMS principles for all types of highway incidents, from small routine incidents to large complicated unexpected disasters.

Cost: \$25

To Access This Resource: To order a hardcopy, contact the International Fire Service Training Association's (IFSTA's) Fire Protection Publications division, part of Oklahoma State University, (800) 654-4055, <http://www.ifsta.org>.



Incident Management (IM) ITS Standards Advisory (2004)

This flier is one of a series of documents that provide state and local transportation agencies with background and guidance on development issues and other key activities related to ITS standards. This flier describes the family of standards developed by the Institute of Electrical and Electronics Engineers (IEEE) that facilitates incident management. The IEEE 1512 family allows traffic management systems and public safety management systems to exchange incident-related information immediately for real-time command and control of resources. The flier profiles each of the four standards in the family (the base standard and standards for traffic incident management, public safety, and hazardous materials), and provides an update on their standards development status. The flier contains case studies on the use of IEEE 1512 standards in New York, Washington, D.C., Utah, and Washington State; and a list of available resources for technical assistance.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.standards.its.dot.gov/Documents/advisories/IM_advisory.pdf
- HyperText Markup Language (HTML) format: http://www.standards.its.dot.gov/Documents/advisories/IM_Advisory.htm



Watching It All Come Together: Case Studies Report on Special Event Planning and Management (FHWA-HOP-04-029) (2004)

This report profiles seven examples of traffic management for planned special events: Texas State Fair in Dallas, Texas; 2000 Democratic National Convention in Los Angeles, California; severe weather in Monroe County, New York; New Year's Eve in Times Square in New York City, New York; after the Independence Day fireworks in Northern Virginia; sporting events at Bank One Ballpark in Phoenix, Arizona; and sporting events at Compaq Center in San Jose, California. The report highlights helpful strategies used by the agencies to get transportation, law enforcement, emergency management, and other stakeholders to work together effectively.

Cost: \$15 for members of the Public Technology Institute (PTI); \$25 for non-members.

To Access This Resource:

- Contact the PTI Store at <http://www.pti.org/index.php/ptiee1/inside/C47>.
- Contact Laurie Radow of the FHWA Office of Transportation Operations, (202) 366-2855, Laurel.Radow@dot.gov.



Managing Travel for Planned Special Events (2003-2007)

This series of documents presents a wide range of information on planning for and managing transportation for planned special events. A handbook, published in 2003, presents a recommended set of policies, regulations, processes, impact mitigation strategies, equipment and personnel resources and technology applications used in planned special events traffic management. A frequently asked questions (FAQ) sheet summarizes the information in the handbook into a list of 33 questions with answers. A two-page fact sheet encapsulates the essential information even further and lists available resources including training opportunities. A presentation guides readers through the special events traffic management planning process. A tri-fold brochure contains

an overview of planned special events traffic management, as well as quotes from transportation operators who have used these techniques with success. An executive summary, published in 2007, provides an overview of planned special events transportation management and includes updated material, such as available training and other tools, as well as references to more recent planned special events. Development of these materials was sponsored by the Transportation Management Center Pooled-Fund Study (TMC PFS).

Cost: Free

To Access This Resource: Access the following website addresses:

- Handbook (FHWA-OP-04-010) (2003)—Adobe Acrobat format: http://www.ops.fhwa.dot.gov/program_areas/sp-events-mgmt/handbook/handbook.pdf
- Handbook—HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13883.html, EDL# 13883 or http://www.ops.fhwa.dot.gov/program_areas/sp-events-mgmt/handbook/index.htm
- Frequently Asked Questions (2003)—Adobe Acrobat format: http://www.ops.fhwa.dot.gov/program_areas/sp-events-mgmt/faq/faq.pdf
- Frequently Asked Questions—HyperText Markup Language format: http://www.ops.fhwa.dot.gov/program_areas/sp-events-mgmt/faq/faq.htm
- Fact Sheet (FHWA-OP-04-033) (2003)—Adobe Acrobat format: http://www.ops.fhwa.dot.gov/program_areas/sp-events-mgmt/fact_sheet/factsheet.pdf
- Fact Sheet—HyperText Markup Language format: http://www.ops.fhwa.dot.gov/program_areas/sp-events-mgmt/fact_sheet/fact_sheet.htm
- Presentation (2003)—HyperText Markup Language format: http://www.ops.fhwa.dot.gov/program_areas/sp-events-mgmt/presentation/presentation.htm
- Presentation—MS PowerPoint format: http://www.ops.fhwa.dot.gov/program_areas/sp-events-mgmt/presentation/presentation.ppt
- Brochure (FHWA-OP-04-033) (2003)—Adobe Acrobat format: http://www.ops.fhwa.dot.gov/program_areas/sp-events-mgmt/brochure/brochure.pdf

- Brochure—HyperText Markup Language format:
http://www.ops.fhwa.dot.gov/program_areas/sp-events-mgmt/brochure/brochure.htm
- Executive Summary (FHWA-HOP-07-108) (2007)—Adobe Acrobat format: http://www.ops.fhwa.dot.gov/program_areas/special_events_mgmt/mng_trvl_exsum/plnd_spcl_evnts.pdf
- Executive Summary—HyperText Markup Language format:
http://www.ops.fhwa.dot.gov/program_areas/special_events_mgmt/mng_trvl_exsum/index.htm



Quick Clearance and “Move It” Best Practices: Executive Summary (2003)

This document summarizes the findings of a survey, conducted by the I-95 Corridor Coalition’s Coordinated Incident Management program track, of quick clearance policies and procedures among its member states and organizations. The report covers both the clearance of major incidents as well as minor crashes and stalled vehicles. This study builds upon the NCHRP Synthesis# 318 *Safe and Quick Clearance of Traffic Incidents*. Other documents related to the I-95 Corridor Coalition’s Quick Clearance and “Move It” Best Practices project can be found at <http://66.167.232.132/pm/ViewProject.asp?pid=128>.

Cost: Free

To Access This Resource: Access the website address <http://66.167.232.132/pm/projectmanagement/Upfiles/reports/summary325.pdf>.



Safe and Quick Clearance of Traffic Incidents (NCHRP Synthesis# 318) (2003)

This report documents the findings of a survey among all 50 states of laws, policies, and procedures that have been used successfully to facilitate the clearance of highway traffic incidents, primarily those blocking travel lanes and attended to by the vehicle operator. The report discusses quick clearance legislation “(‘Move It’ and ‘Steer It, Clear It’ laws)”, hold harmless laws, and

policies governing the removal of accident victims. Also discussed are the duties of private tow truck drivers, policies governing the rapid clearance of semi-tractor trailers, appropriate actions to take when there is an accompanying fuel spill, and technologies to provide uninterrupted information flow between agencies participating in incident clearance.

Cost: \$19 for the hardcopy version; the online version is free.

To Access This Resource: To order the hardcopy version, contact the Transportation Research Board (TRB) Bookstore at <http://www.trb.org/bookstore> and search for "SYH318;" (202) 334-3213, fax: (202) 334-2519. For the online version, access the website address http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_318.pdf.



Traffic Incident Management Tow Operators Workplan (TIMTOW) Guide (2003)

Developed by the Towing & Recovery Association of America (TRAA) with a grant from FHWA, this guide presents a framework for traffic incident management (TIM), and outlines five main issues in TIM site operations: responder safety, secondary crash prevention, traffic control, site management, and quick clearance. Interest by the towing industry in participation as full professional partners in TIM activities has grown considerably in recent years, and one of the purposes of the guide is to show tow operators how they can become more involved. The guide presents an example of successful teamwork among the many actors that can be involved in TIM, as well as establishes a standard of care and level of competency for TIM tow operations.

Cost: Free

To Access This Resource: To order a hardcopy, contact David Helman, FHWA Office of Transportation Operations, (202) 366-8042, David.Helman@dot.gov.



Transportation Planning and Management for Special Events (NCHRP Synthesis# 309) (2003)

This report presents the state-of-the-practice in planning and managing transportation during special events. The report addresses how agencies plan for special events, coordinate services, and manage the overall transportation system. The report will be of interest to any organization with a stake in special event planning, including transportation agencies, law enforcement, fire departments, media, event organizers, political organizations, and the military. Appendices present special event traffic operations plans from Florida, Maryland, and New Hampshire.

Cost: \$16 for the hardcopy version; the online version is free.

To Access This Resource: To order the hardcopy report, contact the Transportation Research Board (TRB) Bookstore at <http://www.trb.org/bookstore> and search for “SYH309,” (202) 334-3213, Fax: (202) 334-2519. For the online version, access the following website addresses:

- Chapters 1 and 2: http://tmcpfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/nchrp_syn_309a.pdf
- Chapter 3: http://tmcpfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/nchrp_syn_309b.pdf
- Chapters 4, 5, 6 and 7: http://tmcpfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/nchrp_syn_309c.pdf
- Chapter 8: http://tmcpfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/nchrp_syn_309d.pdf
- Chapters 9 and 10: http://tmcpfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/nchrp_syn_309e.pdf
- Appendix A: http://tmcpfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/nchrp_syn_309aa.pdf
- Appendix B: http://tmcpfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/nchrp_syn_309ab.pdf
- Appendix C: http://tmcpfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/nchrp_syn_309ac.pdf
- Appendix D: http://tmcpfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/nchrp_syn_309ad.pdf

- Appendix E: http://tmcpfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/nchrp_syn_309ae.pdf
- Appendix F: http://tmcpfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/nchrp_syn_309af.pdf



Regional Traffic Incident Management Programs: Implementation Guide (FHWA-OP-01-002/FTA-TRI-11-00-03) (2001)

This report is one in a series designed to provide public sector project managers with practical “how to” advice on the implementation of selected ITS technologies. This report presents a framework for developing what is missing in almost every urban area in the U.S.—a formal, multi-agency traffic incident management program with endorsement by, participation from, and coordination by senior agency management—and including all the participating agencies. The report discusses each of the steps needed to formalize the incident management effort. The intended audience for this report is project-level managers from organizations typically involved in traffic incident management, such as transportation agencies, law enforcement agencies, fire and rescue agencies, hazardous material (HAZMAT) cleanup services, towing and recovery companies, and public and private traveler information providers.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13149.pdf, EDL# 13149. To order a hardcopy, contact the Operations/ITS HelpLine, (866) 367-7487 or itspubs@dot.gov.



Incident Management Successful Practices: A Cross-Cutting Study (FHWA-JPO-99-018/FTA-TRI-11-99-09) (2000)

This report, one in a series designed to educate public sector managers about particular ITS technologies, examines how several locations across the country are using ITS technology

to overcome agency and jurisdictional barriers to implement effective traffic incident management programs. The report walks through each stage of the traffic incident management timeline (detection, verification, response, site management, traffic management, clearance, and recovery), and shows the different choices made by each location profiled.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/11484.pdf, EDL# 11484.



Traffic Incident Management Handbook (2000)

This handbook is an update of the *Freeway Incident Management Handbook* published in 1991. The handbook provides details on key elements of successful traffic incident management programs, as well as field operations. The handbook includes new and advanced traffic incident management topics. It focuses on the safety benefits achievable through effective traffic incident management, as experienced by crash victims, the motoring public, and response agency field personnel.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/rept_mis/13286.pdf, EDL# 13286. To order a hardcopy, contact David Helman, FHWA Office of Transportation Operations, (202) 366-8042, David.Helman@dot.gov.



What Have We Learned about Intelligent Transportation Systems? Chapter 2: What Have We Learned about Freeway, Incident, and Emergency Management and Electronic Toll Collection? (2000)

This document is an excerpt from a compendium report that looks back on the 10 years of the National ITS Program to examine which ITS technology applications have been successful, which have not been successful, and what the underlying factors are that determine success versus failure. This section examines

freeway, incident, and emergency management and electronic toll collection systems.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13318.pdf, EDL# 13318.



Faster Response Time, Effective Use of Resources—Integrating Transportation and Emergency Management Systems (FHWA-JPO-99-004) (1999)

This brochure, one in a series designed to encourage decision-makers to invest their own budget resources in ITS, examines the safety and efficiency benefits of integrating traffic incident management (typically led by transportation departments) with emergency response (typically run by law enforcement). The brochure quotes leaders in transportation and law enforcement on the benefits they have experienced from co-locating critical functions, sharing communications media, and automating notification to responding agencies.

Cost: Free

To Access This Resource: Access the website address <http://www.itsdocs.fhwa.dot.gov/jpodocs/brochure/6874.pdf>.



Improving Mobility, Saving Lives—Safety Service Patrols (FHWA-JPO-99-005) (1999)

This brochure, one in a series designed to encourage decision-makers to invest their own budget resources in ITS, examines the mobility and safety benefits of safety service patrols. Operated typically by state departments of transportation, these fleets of trucks assist stranded motorists and help manage the flow of traffic during incidents. The brochure quotes chiefs of transportation from around the country on benefits they have experienced from implementing safety service patrol programs. The brochure also contains excerpts from letters from motorists praising the patrols for the assistance they provided.

Cost: Free

To Access This Resource: Access the website address
<http://www.itsdocs.fhwa.dot.gov/jpodocs/brochure/6872.pdf>.



Safer Travel, Improved Economic Productivity—Incident Management Systems (FHWA-JPO-99-006) (1999)

This brochure, one in a series designed to encourage decision-makers to invest their own budget resources in ITS, examines the safety and economic benefits of traffic incident management from the perspective of a state department of transportation commissioner. The brochure quotes transportation officials from around the country about the benefits they have experienced from participating in regional traffic incident management programs.

Cost: Free

To Access This Resource: Access the website address
<http://www.itsdocs.fhwa.dot.gov/jpodocs/brochure/6868.pdf>.



Sharing Resources, Coordinating Response—Deploying and Operating Incident Management Systems (FHWA-JPO-99-007) (1999)

This brochure, one in a series designed to encourage decision-makers to invest their own budget resources in ITS, examines the benefits of traffic incident management from a public safety perspective. The brochure quotes public safety officials from around the country on the benefits they have experienced from participating in traffic incident management programs.

Cost: Free

To Access This Resource: Access the website address
<http://www.itsdocs.fhwa.dot.gov/jpodocs/brochure/6869.pdf>.



Intelligent Transportation Systems Field Operational Test Cross-Cutting Study: Hazardous Material Incident Response (FHWA-JPO-99-035) (1998)

This report summarizes and interprets the results of three field operational tests (FOTs) on the use of new technologies for improving the accuracy and availability of hazardous material (HAZMAT) information provided to emergency response personnel. Topics covered include impacts, user response, technical lessons learned, institutional challenges and resolutions, and implementation costs.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/6327.pdf.



Intelligent Transportation Systems Field Operational Test Cross-Cutting Study: Incident Management: Detection, Verification, and Traffic Management (FHWA-JPO-99-034) (1998)

This report summarizes and interprets the results of several field operational tests (FOTs) on the use of new technologies for improving traffic incident management. Topics covered include impacts, user response, technical lessons learned, institutional challenges and resolutions, and implementation costs.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/6328.pdf.



Managing Traffic Incident and Roadway Emergencies (NHI Course# 133048 or 133048A)

This course addresses the concepts and techniques of traffic incident management. The course focuses on the safety and operational efficiency of responding agencies and the institutional and administrative barriers that hinder interagency cooperation. Course modules cover the main groupings of topics: on-scene traffic incident management operations, multi-agency communications, and program management. Skill Level: Core learning. Target Audience: This course is designed for a multi-agency, multi-disciplinary audience of mid- and upper-level managers from transportation, law enforcement, fire and rescue, emergency medical, emergency communications, and other agencies that respond to traffic incidents. In addition, the target audience also include private sector responders from towing and recovery companies, hazardous materials contractors, and traffic reporting media. Course Length: One or two days.

Cost: \$4,500 or \$6,900 per session (between \$128 and \$345 per participant depending on the number of participants and course length).

To Access This Resource: Contact the NHI Training Team, (703) 235-0534, nhitraining@fhwa.dot.gov or access the website addresses:

- One-day course: http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "133048"
- Two-day course: http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "133048A"



Managing Travel for Planned Special Events (NHI Course# 133099 or 133099A)

This course provides participants with the ability to identify and discuss the key phases, institutional issues, challenges, techniques, and other issues to consider in coordinating, planning, managing, and controlling traffic for planned special events. The following key topics are covered in the course: planned special events overview, pre-event planning and coordination, traffic

management plan and travel demand management initiatives, implementation activities, day-of-event activities, and post-event activities. Participants will be able to apply the recommended concepts and techniques with all five key phases involved with managing travel for a planned special event: (1) program planning, (2) event operations planning, (3) implementation activities, (4) day-of-event activities, and (5) post-event activities. The course will refer to FHWA's *Managing Travel for Planned Special Events Handbook*. The course will guide participants on how to apply key concepts contained in the handbook. Target Audience: The target audience includes transportation managers, service providers, public safety officials, public works directors, and business sector members of chambers of commerce. Operators and planners from states, cities, counties, and metropolitan planning organizations (MPOs) would also benefit from this course. Course Length: One or two days. The two-day version includes scenario-based exercises in a workshop format.

Cost: \$200 per participant for the one-day course; \$300 per participant for the two-day course.

To Access This Resource: Access the following website addresses:

- One-day course: http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "133099A"
- Two-day course: http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "133099"



Transit Points-of-Contact

- Yehuda Gross, ITS Joint Program Office, (202) 366-1988, Yehuda.Gross@dot.gov
- Walter Kulyk, FTA Office of Mobility Innovation, (202) 366-4991, Walter.Kulyk@dot.gov
- Michael Baltes, FTA Office of Mobility Innovation, (202) 366-2182, Michael.Baltes@dot.gov
- Aletha Goodine, FTA Office of Mobility Innovation, (202) 366-6678, Aletha.Goodine@dot.gov
- Steven Mortensen, FTA Office of Mobility Innovation, (202) 493-0459, Steven.Mortensen@dot.gov

<http://>

FTA's Safety & Security Website

This site is a compilation of resources related to safety and security of all aspects of public transportation. Sponsored by the FTA Office of Safety & Security, the site contains listings of publications, training courses, and upcoming conferences. Topics addressed include rail safety, bus safety, emergency management, fire safety, and human factors, as well as the Drug and Alcohol Management Information Statistics (DAMIS) and Safety Management Information Statistics (SAMIS) programs. In response to the terrorist attacks on the World Trade Center and the Pentagon on September 11, 2001, the site includes a "Dear Colleague" letter from the FTA Administrator outlining public transportation security resources which FTA has made available or which are in development. Available transit security resources include a one-page primer on lessons learned by transit agencies in emergency response in New York City and Washington, DC; a registration form to sign up for a mailing list with information on upcoming security awareness and training workshops; and a transit security survey that FTA is asking the members of the community to fill out. The "Dear Colleague" letter also describes a Safety and Security Tool Kit mailed to transit agencies in October 2001 containing several key transit security publications and other resources.

Cost: Free

To Access This Resource: Access the website address <http://transit-safety.volpe.dot.gov>.



FTA's Bus Rapid Transit Website

This site is a compilation of resources related to bus rapid transit (BRT), which combines priority for transit vehicles at traffic signals, cleaner and more quiet vehicles, automated fare collection, and integration with land use policy. This site contains information on BRT projects, upcoming workshops and other events, the winners of a BRT design competition adjudicated by FTA, and a BRT evaluation project being conducted in Honolulu, Hawaii. Several documents are available for downloading from the site, including brochures, reports, and a reference guide. The site also contains BRT news items and related links.

Cost: Free

To Access This Resource: Access the website address http://www.fta.dot.gov/assistance/technology/research_4234.html.



Transit ITS Benefits Impacts Matrix

This matrix serves as a single source for displaying the impacts—benefits, disbenefits, and costs—of ITS technologies for transit. Entries in the matrix are brief summaries of the potential impacts of transit ITS technologies, as well as actual examples of impacts experienced where available. Users can view the matrix by impact area, such as safety and security, service quality, customer satisfaction, capital costs, operations and maintenance costs, increase in revenue, and ridership and market share. Users can also view the matrix by technology, such as fleet management, electronic fare payment, traveler information, transit safety and security, transportation demand management, Transit Intelligent Vehicle Initiative, bus rapid transit, and communications-based train control. Users are invited to contribute new information, and the website has instructions on how to do so.

Cost: Free

To Access This Resource: Access the website address <http://itsweb.noblis.org/aptsmatrix>.



Assessing the Business Case for Integrated Collision Avoidance Systems on Transit Buses (2007)

This document assesses the business case for integrated vehicle-based safety systems (IVBSS) for transit buses. The assessment was conducted in three steps. First, available IVBSS products, possible future IVBSS products, and core IVBSS technologies were analyzed. Second, a cost-benefit analysis of these products and technologies was conducted. Third, transit operators were surveyed as to their receptiveness to IVBSS products, and manufacturers were surveyed as to their willingness to develop products that meet transit operators' needs. Of the IVBSS technologies evaluated, only side object detection systems showed the potential to be cost-effective.

Cost: Free

To Access This Resource: Access the website address http://www.fta.dot.gov/documents/Transit_IVBSS_Business_Case_Analysis_Final_Report_9-07.pdf.



Transit Signal Priority Research Tools (2007)

This report examines transit signal priority (TSP) and the emerging standards used in TSP implementation: National Transportation Communications for ITS Protocol (NTCIP) 1211 "Object Definitions for Signal Control and Prioritization (SCP)" and Transit Communications Interface Protocol (TCIP) 3.0 "Draft Standard for Transit Communication Interface Protocol." The report presents two types of TSP architectures—centralized and distributed—along with real-world examination of TSP systems that use each type. The report shows how the SCP standard can be applied to four different types of TSP operational scenarios: unconditional priority requests, conditional priority requests, prioritizing multiple requests, and schedule- versus headway-based operating policy. The report discusses ITS technologies needed for TSP implementation and modeling tools that can be used to evaluate TSP performance. Several appendices provide additional detail on the real-world TSP examples and modeling tools.

Cost: Free

To Access This Resource: Access the website address http://www.fta.dot.gov/assistance/research/research_5638.html.



ITS Applications for Coordinating and Improving Human Services Transportation: Brochures (2006)

These two brochures are part of a series designed to educate public sector managers about particular ITS technologies. These brochures profile ITS technologies used in providing human services transportation to special populations—older adults, people with disabilities, and low-income individuals—sometimes called “transportation disadvantaged.” One brochure focuses on the benefits of these technologies to passengers; the other focuses on the benefits to transit agencies.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS Helpline, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Better Public Transportation Options for Everyone—Technologies to Improve Accessibility and Service of Public Transportation (FHWA-JPO-05-046)—Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/brochure/14138_files/14138.pdf
- Better Public Transportation Options for Everyone—Technologies to Improve Accessibility and Service of Public Transportation—HyperText Markup Language (HTML) format: <http://www.itsdocs.fhwa.dot.gov/jpodocs/brochure/14138.htm>, EDL# 14138
- Improving Transit Equity, Streamlining Operations—Technologies That Benefit the Transportation Disadvantaged (FHWA-JPO-05-055)—Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/brochure/14139_files/14139.pdf
- Improving Transit Equity, Streamlining Operations—Technologies That Benefit the Transportation Disadvantaged—HyperText Markup Language format: <http://www.itsdocs.fhwa.dot.gov/jpodocs/brochure/14139.htm>, EDL# 14139



ITS Applications for Coordinating and Improving Human Services Transportation: A Cross-Cutting Study (FHWA-JPO-05-056) (2006)

This report is one in a series designed to educate public sector managers about particular ITS technologies. This study profiles six examples of ITS technologies used in providing human services transportation to special populations—older adults, people with disabilities, and low-income individuals—sometimes called “transportation disadvantaged.” This study examines in depth six examples of the use of ITS technologies to coordinate and improve all aspects of transportation provided to these groups: operations, information dissemination, fare payment, and safety and security. The study concludes with keys to success and lessons learned from the six sites.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS HelpLine, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14140_files/14140.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14140.htm, EDL# 14140



Advanced Public Transportation Systems Deployment in the United States: Year 2004 Update (2005)

This report is a compilation of existing and planned deployments of advanced public transportation systems (APTS) technologies and services. The information was collected during the summer and fall of 2004 through contacts with representatives of each transit agency. A total of 516 agencies provided information for this study.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14169_files/14169.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14169.htm, EDL# 14169



Transit Signal Priority: A Planning and Implementation Handbook (2005)

This handbook lays out the steps one should follow to implement a successful transit signal priority (TSP) project, including planning, design, implementation, operations, maintenance, evaluation, verification, and validation. The handbook uses eight in-depth case studies to communicate lessons learned in system architecture, equipment, software, communications, simulation, optimization, institutional issues, and public reaction to TSP. The case studies are presented in their entirety in the handbook's appendices, along with a list of resources and glossary of terms. This handbook was developed by the Intelligent Transportation Society of America (ITS America) with funding from the U.S. DOT.

Cost: Free

To Access This Resource: Access the website address <http://www.itsa.org/itsa/files/pdf/TSPHandbook2005.pdf>. To order a hardcopy, contact David Ridgley, ITS America, (202) 721-4228, DRidgley@itsa.org.



Characteristics of Bus Rapid Transit for Decision-Making (FTA-VA-26-7222-2004-1) (2004)

Bus rapid transit (BRT) combines priority for transit vehicles at traffic signals, cleaner and more quiet vehicles, automated fare collection, and integration with land use policy. This course presents the material contained in the report Characteristics of Bus Rapid Transit for Decision-Making. The course discusses the major elements of BRT, including running way, stations, vehicles, fare collection, ITS, and service and operating plans. The course

also explores how different combinations of these elements can result in different combinations of benefits, such as reduced travel time, increased reliability, increased safety and security, increased capacity, and increased brand recognition and a positive image which, in turn, can lead to increased ridership, customer loyalty, and community support. Course Length: Two days.

Cost: Free

To Access This Resource: Access the website address <http://www.fta.dot.gov/documents/CBRT.pdf>.



An Overview of Transit Signal Priority (2004)

First published in 2002 and updated in 2004, this 27-page brochure provides an overview of transit signal priority (TSP). The brochure covers what TSP is, why it is important, what the costs and benefits are, how to plan for TSP deployment, and what issues to consider in the design, implementation, operations and maintenance of TSP. This brochure was developed by the Intelligent Transportation Society of America with funding from the U.S. DOT.

Cost: Free

To Access This Resource: Access the website address <http://www.itsa.org/itsa/files/pdf/FinalTSPOverviewUpdate.pdf>. To order a hardcopy, contact David Ridgley, ITS America, (202) 721-4228, DRidgley@itsa.org.



FTA National ITS Architecture Consistency Policy: Additional Grantee Guidance (2003)

In 2001, the Federal Transit Administration published its *National ITS Architecture Policy on Transit Projects* to meet the requirement in Section 5206(s) of the Transportation Equity Act for the 21st Century (TEA-21). The policy requires that ITS projects conform to the National ITS Architecture and related standards, and recommended activities that transit agencies should be carrying out in order to meet the policy's requirements. This document contains additional guidance resulting from feedback received

since the policy went into effect. The additional guidance recommends that transit agencies take several key steps: familiarize themselves with the policy, assess how the policy is applicable to their own projects and grants, participate in the ITS architecture development process in their own region, and develop an ITS project architecture for all major ITS projects. The additional guidance recommends that this last step be accomplished by conducting a systems engineering analysis for the ITS and communications components of any major ITS project.

Cost: Free

To Access This Resource: Access the following website addresses:

- Cover letter from FTA Administrator:
http://www.fta.dot.gov/assistance/technology/research_511.html
- Document: <http://www.fta.dot.gov/documents/dc2003.pdf>



Guidance for Developing and Deploying Real-Time Traveler Information Systems for Transit (FTA-OH-26-7017-2003-1) (2003)

This document offers guidance to transit agencies on the development and deployment of real-time transit information systems. The report presents the current state-of-the-practice in real-time transit information systems, components of successful systems, deployment issues and challenges, recommended practices for successful deployment, and a look toward the future of this promising technology.

Cost: Free

To Access This Resource: Access the website address
http://ntl.bts.gov/lib/23000/23600/23663/RTTIS_Final.pdf.



Ventura County Fare Integration: A Case Study (FHWA-OP-01-033/ FTA-TRI-11-01-01) (2001)

This report is one in a series designed to educate public sector managers about particular ITS technologies. Starting in 1996, transit agencies in Ventura County, California, field-tested an

electronic fare payment system called “Smart Passport.” The demonstration ended in 1999 without Ventura County transit operators experiencing many of the program’s anticipated benefits. The demonstration was conducted when the National ITS Program was in its early stages and few resources were available to assist the local participants. Today, the experiences of Ventura County have much to teach us. This case study contains insights gained in institutional needs, technical requirements, and customer acceptance techniques that can be helpful to those deploying any new technology in an operational setting.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13479/13479.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13479.html, EDL# 13479



Advanced Public Transportation Systems: Update 2000 (FTA-MA-26-7007-00-1) (2000)

This report is the latest in a series of “State-of-the-Art” reports, the last of which was published in January 1998. These reports catalogue the extent of adoption of advanced technology in the provision of public transportation service in North America. The first report was published in 1991, and subsequent updates have been published every other year since 1992. This report focuses on some of the most innovative or comprehensive implementations, which are categorized into one of four types of services or technologies: fleet management, traveler information, electronic fare payment, and transportation demand management.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13583.pdf, EDL# 13583. To order a hardcopy, contact the FTA Office of Mobility Innovation, (202) 366-4995.



Advanced Public Transportation Systems Publications (2000)

This CD-ROM contains nearly 100 advanced public transportation systems (APTS) reports published in the 1990s as part of the Transit ITS Program. The reports cover topics such as fleet management, traveler information, electronic payment systems, transportation demand management, and the Transit Intelligent Vehicle Initiative (IVI).

Cost: Free

To Access This Resource: To order a copy of the CD-ROM, contact the FTA Office of Mobility Innovation, (202) 366-4995.



Automatic Vehicle Location Successful Transit Applications: A Cross-Cutting Study (FHWA-OP-99-022/FTA-TRI-11-99-12) (2000)

This report is one in a series designed to educate public sector managers about particular ITS technologies. Transit agencies across the country are turning to automatic vehicle location (AVL) to increase the safety and efficiency of their operations. This report provides an in-depth examination of six agencies' experience with AVL, including the challenges they faced, how those challenges were overcome, and the benefits gained from AVL implementation.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/11487.pdf.



Benefits Assessment of Advanced Public Transportation System Technologies: Update 2000 (FTA-MA-26-7007-00-4) (2000)

This report presents "order-of-magnitude" estimates of the expected benefits to the transit industry of the application of advanced public transportation system (APTS) technologies. The

study identifies and quantifies major benefits derived from current applications of APTS technologies and projects benefits based on forecasts and reasonable assumptions to a national level.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13334.pdf, EDL# 13334. To order a hardcopy, contact the FTA Office of Mobility Innovation, (202) 366-4995.



What Have We Learned about Intelligent Transportation Systems? Chapter 5: What Have We Learned about Advanced Public Transportation Systems? (2000)

This document is an excerpt from a compendium report that looks back on the 10 years of the National ITS Program to examine which ITS technology applications have been successful, which have not been successful, and what the underlying factors are that determine success versus failure. This section examines advanced public transportation systems (APTS) such as automatic vehicle location; operations software; computer-aided dispatching; mobile data terminals; silent alarms/covert microphones; surveillance cameras on transit vehicles; automated passenger counters; pre-trip, en route, and in-vehicle passenger information; vehicle diagnostic systems; transit traffic signal priority for transit vehicles; and electronic fare payment.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13321.pdf, EDL# 13321.



Better Service, Greater Efficiency—Transit Management for Demand-Responsive Systems (FTA-TRI-10-98-2) (1999)

This brochure, one in a series designed to encourage decision-makers to invest their own budget resources in ITS, examines the efficiency and service benefits of using automatic vehicle location (AVL) and computer-aided dispatching (CAD) systems

in demand-responsive transit fleets. The brochure quotes from managers of paratransit systems about the benefits they have experienced using CAD/AVL.

Cost: Free

To Access This Resource: Access the website address <http://www.itsdocs.fhwa.dot.gov/jpodocs/brochure/6876.pdf>.



Better Service, Safer Service—Transit Management for Fixed-Route Systems (FTA-TRI-10-98-1) (1999)

This brochure, one in a series designed to encourage decision-makers to invest their own budget resources in ITS, examines the safety and improved service benefits of installing automatic vehicle location (AVL) on fixed-route transit fleets. The brochure quotes transit agency executive directors, drivers, and dispatchers about the benefits they have experienced from using these systems.

Cost: Free

To Access This Resource: Access the website address <http://www.itsdocs.fhwa.dot.gov/jpodocs/brochure/6875.pdf>.



Strategies for Improved Traveler Information (TCRP Report# 92) (2003)

This report summarizes the state of the practice in the provision of advanced traveler information services (ATIS) to transit riders. This report identifies transit traveler information needs, assesses the state of the art in providing transit traveler information, contains examples of customer information systems for both within and outside the transit industry, discusses transit traveler information as part of a larger continuity of information systems, and looks to the future of this promising new facet of the transit industry.

Cost: \$22 for the hardcopy version; the online version is free.

To Access This Resource: To order the hardcopy version, contact the Transportation Research Board (TRB) Bookstore at <http://www.trb.org/bookstore> and search for “TC092,” (202) 334-3213, fax: (202) 334-2519. For the online version, access the website address http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_92.pdf.



e-Transit: Electronic Business Strategies for Public Transportation, Volume 4: Advanced Features of Transit Websites (TCRP Report# 84) (2003)

This report is the fourth volume in the TCRP 84 series, which examines the application of electronic business strategies to public transportation and mobility management. This report examines the use by transit agencies of the Internet and other Web-based services, such as automated itinerary planning systems, real-time transit information, and e-mail notification. The report also discusses the application of customer relationship management concepts to these services. The report covers technology options, implementation considerations, best practices, and lessons learned.

Cost: \$15 for the hardcopy version; the online version is free.

To Access This Resource: To order the hardcopy report and CD-ROM, contact the Transportation Research Board (TRB) Bookstore at <http://www.trb.org/bookstore> and search for "TC084D," (202) 334-3213, fax: (202) 334-2519. For the online version, access the website address http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_84v4.pdf.



Guidebook for Selecting Technology for Rural and Small Urban Public Transportation Systems (TCRP Report# 76) (2002)

This guidebook helps public transportation professionals identify appropriate technologies for their transit systems, which can range from off-the-shelf computer software to automatic vehicle location (AVL) systems. The guidebook encourages readers to conduct a self-assessment of the services, character, and environment of their own transit system in order to select the technology best suited to their needs. The guidebook lists grants and revenue sources that can be used to pay for these technologies. Finally, the guidebook offers recommendations on developing an implementation plan, conducting the procurement process, and installing the new technology system.

Cost: \$17 for the hardcopy version; the online version is free.

To Access This Resource: To order the hardcopy version, contact the Transportation Research Board (TRB) Bookstore at <http://www.trb.org/bookstore> and search for "TC076," (202) 334-3213, fax: (202) 334-2519. For the online version, access the website address http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_76.pdf.



Simulators and Bus Safety: Guidelines for Acquiring and Using Transit Bus Operator Driving Simulators (TCRP Report# 72) (2001)

Driving simulators hold great promise for training student bus operators more efficiently and safely than traditional training methods. However, only a handful of transit agencies are using driving simulation, and even among these agencies, different types of simulations are being used. This report provides guidelines for transit agencies to determine if they should procure and use simulators and associated advanced technology training tools.

Cost: \$25 for the hardcopy version; the online version is free.

To Access This Resource: To order the hardcopy version, contact the Transportation Research Board (TRB) Bookstore at <http://www.trb.org/bookstore> and search for "TC072," (202) 334-3213, fax: (202) 334-2519. For the online version, access the website address http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_72.pdf.



Using Geographic Information Systems for Welfare to Work Transportation Planning and Service Delivery: A Handbook (TCRP Report# 60) (2000)

The purpose of this handbook is to facilitate use of geographic information systems (GIS) as a tool among organizations responsible for planning or providing transportation services in response to welfare reform, including trip itinerary planning. This handbook includes guidance on how agencies can either implement GIS or enhance their current GIS applications for this

purpose. Accompanying the handbook is a CD-ROM containing three case study descriptions and color illustrations of GIS application for transit planning and welfare-to-work.

Cost: \$30 for the hardcopy version; the online version is free.

To Access This Resource: To order the hardcopy report and CD-ROM, contact the Transportation Research Board (TRB) Bookstore at <http://www.trb.org/bookstore> and search for "TC060," (202) 334-3213, fax: (202) 334-2519. For the online version, access the following website addresses:

- Introduction and Chapters 1, 2, 3, 4, and 5: http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_60-a.pdf
- Chapter 6 and Appendices: http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_60-b.pdf
- Case Studies: http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_webdoc_14.pdf



Understanding and Applying Advanced On-Board Bus Electronics (TCRP Report# 43) (1999)

This report provides an overview of electronics and their application to bus operations and other transportation sectors. The report addresses electronic integration, potential benefits offered by integration, and transit agency experiences with the technology. The report concludes with guidelines for implementing bus transit electronics. This report is intended to be a primer on the subject, by providing essential background information to serve as a starting point for acquiring additional knowledge. The intended audience of this report is transit managers, operations and maintenance professionals, bus procurement specialists, bus manufacturers and suppliers, and others interested in the application of advanced electronics to transit buses.

Cost: \$30 for the hardcopy version; the online version is free.

To Access This Resource: To order the hardcopy version, contact the Transportation Research Board (TRB) Bookstore at <http://www.trb.org/bookstore> and search for "TC043," (202) 334-3213, fax: (202) 334-2519. For the online version, access the website address http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_43.pdf.



Multipurpose Transit Payment Media (TCRP Report# 32) (1998)

This report examines the potential for introducing multipurpose payment smart cards that can be used to purchase transit services from multiple operators, as well as other goods and services such as parking and retail products. Topics covered include smart card technology, the legal and institutional issues associated with introducing multipurpose smart card programs, cost and revenue impacts, and customer acceptance. The report presents guidelines for the development of multipurpose fare payment programs. The intended audiences for this report are transit managers, transit operations personnel involved with fare collection, parking professionals, and representatives of the financial services industry.

Cost: \$36 for the hardcopy version; the online version is free.

To Access This Resource: To order the hardcopy version, contact the Transportation Research Board (TRB) Bookstore at <http://www.trb.org/bookstore> and search for "TC032," (202) 334-3213, fax: (202) 334-2519. For the online version, access the website address http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_32.pdf.



A Handbook for Acquiring Demand-Responsive Transit Software (TCRP Report# 18) (1996)

This handbook is intended to assist providers of demand-responsive transit (DRT) in the selection, acquisition, and implementation of software for DRT operations and administration. The purpose of this handbook is to advise providers of DRT services about computer software and other technology appropriate for DRT applications, and to assist software vendors in understanding the market for DRT software and technologies.

Cost: \$26 for the hardcopy version; the online version is free.

To Access This Resource: To order the hardcopy version, contact the Transportation Research Board (TRB) Bookstore at <http://www.trb.org/bookstore> and search for "TC018," (202) 334-3213, fax: (202) 334-2519. For the online version, access the website address http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_18.pdf.



The Impact of Radio Frequency Refarming on Transit Communications (TCRP Report# 11) (1996)

This report examines the impact of the Federal Communications Commission (FCC) rules governing the refarming of the land mobile radio spectrum on current and future transit communication system requirements. The intended audience for this report is general managers, operations managers, and communication specialists responsible for communications systems within transit and paratransit organizations.

Cost: \$20 for the hardcopy version; the online version is free.

To Access This Resource: To order the hardcopy version, contact the Transportation Research Board (TRB) Bookstore at <http://www.trb.org/bookstore> and search for "TC011," (202) 334-3213, fax: (202) 334-2519. For the online version, access the website address http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_11.pdf.



Real-Time Bus Arrival Information Systems (TCRP Synthesis# 48) (1998)

This synthesis report examines real-time bus arrival systems, including technological capabilities, agency experience, cost, and reactions of transit passengers. The report describes the state of the practice in the U.S. and internationally.

Cost: \$15 for the hardcopy version; the online version is free.

To Access This Resource: To order the hardcopy version, contact the Transportation Research Board (TRB) Bookstore at <http://www.trb.org/bookstore> and search for "TS048," (202) 334-3213, fax: (202) 334-2519. For the online version, access the website address http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_syn_48.pdf.



Passenger Counting Technologies and Procedures (TCRP Synthesis# 29) (1998)

This synthesis report summarizes information from selected transit agencies about the benefits and problems associated with passenger counting technologies. The report also provides advice for agencies considering the purchase of a passenger counting system, discussing such issues as data collection methodology, data processing, end uses of ridership data, organizational responsibilities, and resource requirements. The intended audiences are transit agency general managers; their planning and schedule, operations and maintenance, computer services, and budget and finance staffs; as well as passenger counting technology providers.

Cost: Free

To Access This Resource: Access the website address <http://onlinepubs.trb.org/onlinepubs/tcrp/tsyn29.pdf>.



AVL Systems for Bus Transit (TCRP Synthesis# 24) (1997)

This synthesis report addresses various aspects of developing and deploying automated vehicle location (AVL) systems for bus transit. Current practice, AVL architecture and technologies, and the institutional context of AVL, in terms of funding, justification, staffing, and procurement, are discussed. This report describes different approaches to AVL deployment used at selected transit agencies. The intended audiences for this report are transit agency general managers, bus operations, planning, scheduling, safety, and procurement staff, as well as agency communications and engineering staff.

Cost: \$16 for the hardcopy version; the online version is free.

To Access This Resource: To order the hardcopy version, contact the Transportation Research Board (TRB) Bookstore at <http://www.trb.org/bookstore> and search for "TS024," (202) 334-3213, fax: (202) 334-2519. For the online version, access the website address <http://onlinepubs.trb.org/onlinepubs/tcrp/tsyn24.pdf>.



Characteristics and Planning of Bus Rapid Transit (BRT)

This course presents an overview of bus rapid transit (BRT), based on the 2004 report *Characteristics of Bus Rapid Transit for Decision-Making*. The course discusses the major elements of BRT, including running way, stations, vehicles, fare collection, ITS, and service and operating plans. The course also explores how different combinations of these elements can result in different combinations of benefits, such as reduced travel time, increased reliability, increased safety and security, increased capacity, and increased brand recognition and a positive image which, in turn, can lead to increased ridership, customer loyalty, community support. Numerous case studies are used to illustrate concepts presented in the course. Course Length: Two days.

Cost: Free for Federal, state, and local government employees; \$450 for contractors and consultants.

To Access This Resource: Access the website address <http://www.ntionline.com/CourseInfo.asp?CourseNumber=ID030> or contact Susan Greenstone, National Transit Institute, (732) 932-1700 x219, SGreenstone@nti.rutgers.edu.



Intelligent Transportation Staffing

Human resources are the key to a successful deployment of ITS in a transit agency. It is important that organizations have people in place that know how to create disparate parts of an organization into a team, set realistic goals, implement and use the technology, interpret the data, and derive the optimum benefits from the system. These staffing needs transcend all departments. How does an agency that is planning an ITS deployment ensure that its organization is appropriately staffed to ensure a successful and profitable implementation? This course will address these questions and provide participants with a toolkit to recruit, interview, hire, train, and retain employees who are critical to an ITS purchase and deployment. Target Audience: Transit managers, human resource personnel, employees assigned to an ITS project who need additional personnel, consultants, decision-makers, project management managers, and staff of agencies participating in regional ITS projects. State departments of transportation,

metropolitan planning organizations (MPOs), and county and municipal government staff would also benefit from this course. Course Length: Two days.

Cost: Free for Federal, state, and local government employees; \$300 for contractors and consultants.

To Access This Resource: Access the website address <http://www.ntionline.com/CourseInfo.asp?CourseNumber=ID050> or contact Susan Greenstone, National Transit Institute, (732) 932-1700 x219, SGreenstone@nti.rutgers.edu.



Multimodal Traveler Information Systems

The course identifies the issues, requirements, recommendations, lessons learned and best practices of implementing and operating advanced traveler information systems (ATIS). The course discusses the different types of traveler information that ATIS can provide, including transit information, traffic information, and multimodal information, as well as various ATIS delivery mechanisms such as 511. The course explores how pre-trip information, including automated trip itinerary planning, differs from information that travelers want while en route. Participants will learn how to measure customer preferences and how to respond to what customers prefer. Finally, the course discusses relevant ITS standards and conformity with the National ITS Architecture.

Cost: Free for Federal, state and local government employees; \$300 for contractors and consultants.

To Access This Resource: Access the website address <http://www.ntionline.com/CourseInfo.asp?CourseNumber=ID007A> or contact Susan Greenstone, National Transit Institute, (732) 932-1700 x219, SGreenstone@nti.rutgers.edu.



Transit ITS Regional Workshop

This introductory-level workshop explores how the core suite of transit ITS technologies can increase the safety and efficiency of transit systems. In this course, participants will learn what the core suite of transit ITS technologies are and how they can be integrated into the wider context of regional transportation goals

using a regional ITS architecture. The course will also address best practices in systems engineering, procurement of advanced technologies, and strategic planning. Case studies from successful transit ITS applications will be used to illustrate their benefits.

Course Length: Two days.

Cost: Free for Federal, state, and local government employees; \$300 for contractors and consultants.

To Access This Resource: Access the website address <http://www.ntionline.com/CourseInfo.asp?CourseNumber=TRI-26> or contact Susan Greenstone, National Transit Institute, (732) 932-1700 x219, SGreenstone@nti.rutgers.edu.



Transportation Management Centers Points-of-Contact

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TMC Pooled-Fund Study Website

This site is the official website of the Pooled-Fund Study (PFS) on Traffic Management Centers (TMCs). The purpose of the TMC Pooled-Fund Study is to identify and address the key issues and challenges that managers and operators of TMCs are facing. The Pooled-Fund Study provides a mechanism to pursue projects that address common needs among participating members. Any agency responsible for managing travel on any surface transportation system is eligible to join, and the website has information on how to do so. The website also contains the Pooled-Fund Study's list of current projects and their status, list of completed projects and products delivered, charter membership list, and materials related to past and upcoming meetings such as agendas, minutes, and handouts. The Pooled-Fund Study welcomes proposals for new projects, and the website has instructions on how to submit new project ideas.

Cost: Free

To Access This Resource: Access the website address <http://tmcdfs.ops.fhwa.dot.gov>.



TMCOps

This tool assists the user in developing knowledge, skills and ability (KSA) requirements for transportation management center (TMC) operations personnel. These KSA requirements enable

transportation professionals to develop position descriptions and job classifications based on the tasks the TMC operator is required to perform and to consider the tasks performed by an operator in support of an overall systems engineering process of a TMC. This tool encapsulates the information contained in the document *TMC Operator Requirements and Position Description*. Development of this tool and *TMC Operator Requirements and Position Descriptions* was sponsored by the Transportation Management Center Pooled-Fund Study (TMC PFS).

Cost: Free

To Access This Resource: Access the website address http://tmcops.gtri.gatech.edu/tool_home.php.



TMC Staffing and Scheduling Tool

This software tool automates three of the processes described in the document *TMC Staffing and Scheduling for Day-to-Day Operations*: shift scheduling, days-off scheduling, and the calculation of a relief factor. Development of this tool and *TMC Staffing and Scheduling for Day-to-Day Operations* was sponsored by the Transportation Management Center Pooled-Fund Study (TMC PFS).

Cost: Free

To Access This Resource: Access the website address http://tmc pfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/Final_TMC_Staffing_Tool.zip.



Center-to-Field (C2F) Communications Profiles Standards Advisory (2007)

This flier is one of a series of documents that provide state and local transportation agencies with background and guidance on development issues and other key activities related to ITS standards. Center-to-Field (C2F) communications take place between a traffic management center (TMC) and one or more field devices managed by that center. C2F communications cover lower layer interfaces between a TMC and such devices as dynamic message signs (DMSs), traffic signals, ramp meters, environmental sensor stations (ESSs), closed-circuit television (CCTV) cameras and data collection devices. C2F standards can

be divided into two categories: (1) message and data content and (2) rules for exchanging messages and data. The focus of this ITS Standards Advisory is on the rules for exchanging messages and data, called “C2F communications profile standards.” The flier contains a list of C2F communications profile standards, a list of C2F resources, and a list of C2F documents and guides.

Cost: Free

To Access This Resource: Access the website address http://www.standards.its.dot.gov/Documents/advisories/adv_c2f_bg.asp.



Center-to-Center (C2C) Communications Profiles Standards Advisory (2006)

This flier is one of a series of documents that provide state and local transportation agencies with background and guidance on development issues and other key activities related to ITS standards. Center-to-Center (C2C) communications relate to all aspects of ITS. They cover the exchange of data between computers physically located in different transportation management facilities (e.g., traffic management centers, transit management centers, emergency management centers, and parking management centers). C2C standards enable exchange of data, determine what information is exchanged and how and when it is exchanged, as well as the underlying transport mechanisms. C2C standards can be divided into two categories: (1) message and data content and (2) rules for exchanging messages and data. The focus of this ITS standards advisory is on the rules for exchanging messages and data, called “C2C communications profile standards.” The flier contains a list of C2C communications profile standards, a list of C2C standards resources, and a list of C2C documents and guides.

Cost: Free

To Access This Resource: Access the website address: http://www.standards.its.dot.gov/Documents/advisories/adv_c2c_bg.asp.



Coordinated Freeway and Arterial Operations Handbook (FHWA-HRT-06-095) (2006)

This handbook provides direction, guidance, and recommendations on how to coordinate freeway and arterial operations in a proactive and comprehensive manner. The handbook defines coordinated freeway and arterial (CFA) operations and discusses how to apply CFA to four areas of high pay-off: traffic incident management, work zone management, planned special events management, and day-to-day (or recurring) operations. The handbook concludes with a discussion of new technologies such as ITS and an example of CFA in an incident management program in Northern Virginia. Development of this handbook was sponsored by the Transportation Management Center Pooled-Fund Study (TMC PFS).

Cost: Free

To Access This Resource: Access the website address http://tmc pfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/06095.pdf.



Integration of Emergency and Weather Elements into Transportation Management Centers (FHWA-HOP-06-090) (2006)

This report documents the findings of a study that examined how weather and emergency information is being integrated into operations at 38 transportation management centers (TMCs) across the country. The study was sponsored jointly by the FHWA Road Weather Management Program and the FHWA Emergency Transportation Operations Program. The report describes the state-of-the-practice in integration of weather and emergency information into TMC operations. The report also identifies best practices, discusses the benefits and challenges of integration, and offers recommendations on how to get started and how to enhance current weather/emergency integration at one's own TMC.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://www.ops.fhwa.dot.gov/weather/resources/publications/tcmintegration/finalrpttmc22806.pdf>
- HyperText Markup Language (HTML) format: <http://www.ops.fhwa.dot.gov/weather/resources/publications/tcmintegration/index.htm>



Ramp Management and Control Handbook (2006)

This handbook provides guidance and recommended practices on managing and controlling traffic on ramps with freeway facilities. The handbook discusses several ramp management strategies, including how to select appropriate strategies and develop ramp management plans, how to implement those strategies and plans, how to operate and maintain these strategies, and how to assess their performance and report on the results. This handbook also describes in greater depth the issues and concepts specific to ramp management and control presented in Chapter 7 of the *Freeway Management and Operations Handbook*. In addition to the *Ramp Management and Control Handbook*, key concepts of ramp management and control are summarized in a primer, brochure, fact sheet, and frequently asked questions (FAQ) document. Development of these materials was sponsored by the Transportation Management Center Pooled-Fund Study (TMC PFS).

Cost: Free

To Access This Resource: Access the following website addresses:

- Handbook (FHWA-HOP-06-001)—Adobe Acrobat format: http://ops.fhwa.dot.gov/publications/ramp_mgmt_handbook/manual/manual/pdf/rm_handbook.pdf
- Handbook—HyperText Markup Language (HTML): http://ops.fhwa.dot.gov/publications/ramp_mgmt_handbook/manual/manual/default.htm, EDL# 14242
- Primer (FHWA-HOP-06-080)—Adobe Acrobat format: http://ops.fhwa.dot.gov/publications/ramp_mgmt_handbook/primer/rm_primer.pdf

- Primer—HyperText Markup Language format:
http://ops.fhwa.dot.gov/publications/ramp_mgmt_handbook/primer/primer.htm
- Brochure (FHWA-HOP-06-082)—Adobe Acrobat format:
http://ops.fhwa.dot.gov/publications/ramp_mgmt_handbook/brochure/rm_brochure.pdf
- Brochure—HyperText Markup Language format:
http://ops.fhwa.dot.gov/publications/ramp_mgmt_handbook/brochure/brochure.htm
- Project Fact Sheet (FHWA-HOP-06-082)—Adobe Acrobat format: http://ops.fhwa.dot.gov/publications/ramp_mgmt_handbook/factsheet/rm_fact_sheet.pdf
- Project Fact Sheet—HyperText Markup Language format:
http://ops.fhwa.dot.gov/publications/ramp_mgmt_handbook/factsheet/factsheet.htm
- Questions and Answers (FHWA-HOP-06-083)—Adobe Acrobat format: http://ops.fhwa.dot.gov/publications/ramp_mgmt_handbook/faqs/rm_faqs.pdf
- Questions and Answers—HyperText Markup Language format: http://ops.fhwa.dot.gov/publications/ramp_mgmt_handbook/faqs/ramp_faqs.htm



Transportation Management Center Staffing and Scheduling for Day-to-Day Operations (2006)

This document provides an introduction to the concept of work analysis, scheduling, and staff planning needed for staffing a transportation management center (TMC). The document explores several methods of work analysis, including job analysis, workload analysis, and demand analysis. The document discusses various aspects of staff scheduling, including who should have the responsibility for scheduling employees and methods for developing a schedule. The document concludes by showing how to develop a staffing plan and how to plan for emergencies. An appendix contains a case study from the Arizona TMC. This document serves as a companion to the TMC Staffing and Scheduling Tool. Development of this document and the TMC Staffing and Scheduling Tool was sponsored by the Transportation Management Center Pooled-Fund Study (TMC PFS).

Cost: Free

To Access This Resource: Access the website address http://tmcpsf.ops.fhwa.dot.gov/cfprojects/uploaded_files/Final_Technical_Document1.pdf.



Handbook for Developing a TMC Operations Manual (2005)

This handbook shows how to develop an operations manual for a transportation management center (TMC). The handbook explains why a TMC operations manual is important, describes the components of a manual, and identifies the activities and participants needed to develop and update a manual. The handbook provides a checklist that can be used in the development of a TMC operations manual and presents case studies on TMC operations manual development from Northern Virginia and Orlando, Florida. Development of this handbook was sponsored by the Transportation Management Center Pooled-Fund Study (TMC PFS).

Cost: Free

To Access This Resource: Access the website address http://tmcpsf.ops.fhwa.dot.gov/cfprojects/uploaded_files/Handbook_TMC_Ops_Manual1.pdf.



Impacts of Using Dynamic Features to Display Messages on Changeable Message Signs (FHWA-HOP-05-069) (2005)

This report documents the findings of an evaluation of how well drivers comprehend messages displayed on changeable message signs (CMSs) that use dynamic features, i.e., text that flashes or alternates between multiple pieces of text. The evaluation was conducted in a driving simulator with 64 subjects. The study found that dynamic features have an adverse effect on drivers' ability to comprehend CMS messages. This research was sponsored by the Transportation Management Center Pooled-Fund Study (TMC PFS).

Cost: Free

To Access This Resource: Access the website address http://tmc pfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/Final%20Research%20Report%20091905.pdf.



Changeable Message Sign Operation and Messaging Handbook (FHWA-OP-03-070) (2004)

This handbook is a consolidation of the most current and best information on the design and display of effective changeable message sign (CMS) messages for incident and roadwork events. The handbook presents this information in a series of 10 modules, and covers topics such as fundamentals of CMS operations, CMS operating policies, principles of CMS message design, dealing with long messages, establishing a maximum message length, formatting messages, and the CMS message design process. The handbook is designed to help both new and experienced users of CMSs at various levels of a given agency. Development of this handbook was sponsored by the Transportation Management Center Pooled-Fund Study (TMC PFS).

Cost: Free

To Access This Resource: Access the website address http://tmc pfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/CMS%20Operation%20and%20Messaging%20Handbook-Final%20Draft.pdf.



TMC Operator Requirements and Position Descriptions (2004)

This document provides guidance on how to develop knowledge, skills and ability (KSA) requirements for transportation management center (TMC) operations personnel. These KSA requirements enable transportation professionals to develop position descriptions and job classifications based on the tasks the TMC operator is required to perform and to consider the tasks performed by an operator in support of an overall systems engineering process of a TMC. This document serves as a companion to the TMCops software tool. Development of this document and the TMCops tool was sponsored

by the Transportation Management Center Pooled-Fund Study (TMC PFS).

Cost: Free

To Access This Resource: Access the website address http://tmcdfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/tmc_opreq_pds.pdf.



Configuration Management for Transportation Management Systems: Final Report (FHWA-OP-04-013) (2003)

This handbook provides an introduction to configuration management (CM) in a transportation context. The handbook defines configuration management, describes current CM practices, and discusses CM processes and plans. The handbook provides guidance on how to establish a formal CM program and concludes with a list of CM resources and tools. Development of this handbook was sponsored by the Transportation Management Center Pooled-Fund Study (TMC PFS).

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://tmcdfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/CM%20for%20TMS%20Handbook%20v3.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13885.html, EDL# 13885



Freeway Management and Operations Handbook (FHWA-OP-04-003) (2003)

This handbook provides an overview of the institutional and technical issues associated with the planning, design, implementation, and management of a freeway network. The 2003 edition is an update of the 1997 edition and is the third update to be published by FHWA. The handbook examines a wide variety of strategies, tools, and technologies that can be used to support management and operation of the freeway network. Development of this handbook was sponsored by the Transportation Management Center Pooled-Fund Study (TMC PFS).

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/freewaymgmt/publications/frwy_mgmt_handbook/fmoh_complete_all.pdf
- HyperText Markup Language (HTML) format: http://www.ops.fhwa.dot.gov/freewaymgmt/publications/frwy_mgmt_handbook/index.htm



Managing Travel for Planned Special Events (2003-2007)

This series of documents presents a wide range of information on planning for and managing transportation for planned special events. A handbook, published in 2003, presents a recommended set of policies, regulations, processes, impact mitigation strategies, equipment and personnel resources and technology applications used in planned special events traffic management. A frequently asked questions (FAQ) sheet summarizes the information in the handbook into a list of 33 questions with answers. A two-page fact sheet encapsulates the essential information even further and lists available resources including training opportunities. A presentation guides readers through the special events traffic management planning process. A tri-fold brochure contains an overview of planned special events traffic management, as well as quotes from transportation operators who have used these techniques with success. An executive summary, published in 2007, provides an overview of planned transportation management of special events and includes updated material, such as available training and other tools, as well as references to more recent planned special events. Development of these materials was sponsored by the Transportation Management Center Pooled-Fund Study (TMC PFS).

Cost: Free

To Access This Resource: Access the following website addresses:

- Handbook (FHWA-OP-04-010) (2003)—Adobe Acrobat format: http://www.ops.fhwa.dot.gov/program_areas/sp-events-mgmt/handbook/handbook.pdf

- Handbook—HyperText Markup Language (HTML) format:
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13883.html,
EDL# 13883 or http://www.ops.fhwa.dot.gov/program_areas/sp-events-mgmt/handbook/index.htm
- Frequently Asked Questions (2003)—Adobe Acrobat format:
http://www.ops.fhwa.dot.gov/program_areas/sp-events-mgmt/faq/faq.pdf
- Frequently Asked Questions—HyperText Markup Language format: http://www.ops.fhwa.dot.gov/program_areas/sp-events-mgmt/faq/faq.htm
- Fact Sheet (FHWA-OP-04-033) (2003)—Adobe Acrobat format: http://www.ops.fhwa.dot.gov/program_areas/sp-events-mgmt/fact_sheet/factsheet.pdf
- Fact Sheet—HyperText Markup Language format:
http://www.ops.fhwa.dot.gov/program_areas/sp-events-mgmt/fact_sheet/fact_sheet.htm
- Presentation (2003)—HyperText Markup Language format:
http://www.ops.fhwa.dot.gov/program_areas/sp-events-mgmt/presentation/presentation.htm
- Presentation—MS PowerPoint format:
http://www.ops.fhwa.dot.gov/program_areas/sp-events-mgmt/presentation/presentation.ppt
- Brochure (FHWA-OP-04-033) (2003)—Adobe Acrobat format: http://www.ops.fhwa.dot.gov/program_areas/sp-events-mgmt/brochure/brochure.pdf
- Brochure—HyperText Markup Language format:
http://www.ops.fhwa.dot.gov/program_areas/sp-events-mgmt/brochure/brochure.htm
- Executive Summary (FHWA-HOP-07-108) (2007)—Adobe Acrobat format: http://www.ops.fhwa.dot.gov/program_areas/special_events_mgmt/mng_trvl_exsum/plnd_spcl_evnts.pdf
- Executive Summary—HyperText Markup Language format:
http://www.ops.fhwa.dot.gov/program_areas/special_events_mgmt/mng_trvl_exsum/index.htm



Guidelines for Transportation Management Systems Maintenance Concept and Plans (FHWA-OP-04-011) (2002)

This report provides an overview of the institutional, procedural, programmatic, and technical issues associated with the maintenance of a transportation management center system. The report describes the importance of developing a maintenance concept, maintenance program, and a multiyear maintenance plan. The report also provides guidance on how to develop these materials and to integrate maintenance considerations into all phases of the transportation management system life cycle. Development of this report was sponsored by the Transportation Management Center Pooled-Fund Study (TMC PFS).

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://tmcpfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/Guidelines%20for%20TMS%20Maintenance.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13882.html, EDL# 13882



4th Conference on Integrated Transportation Management Systems: Proceedings and White Papers (2002)

These documents provide a summary of the 4th Integrated Transportation Management Systems (ITMS) Conference, held July 15-18, 2002, in Newark, New Jersey. The symposium was sponsored by the Transportation Research Board (TRB) and FHWA, in cooperation with the Institute of Transportation Engineers (ITE), the Intelligent Transportation Society of America (ITS America) and the American Association of State Highway and Transportation Officials (AASHTO). The goal of the conference was to identify potential initiatives and opportunities to help advance the state-of-the-art in planning, designing, deploying, operating, and evaluating ITMS. Seven white papers were prepared prior to the conference to help frame key issues. The

proceedings summarize the presentations from the general and breakout sessions.

Cost: Free

To Access This Resource: Access the following website addresses:

- Proceedings: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13661.pdf, EDL# 13661
- White Papers: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13662.pdf, EDL# 13662



Traffic Control System Operations: Installation, Management and Maintenance (2000)

This manual presents a general tutorial on traffic system maintenance-related issues in traffic control and traffic management. The manual updates and expands information contained in the 1989 edition to address ITS and other new traffic signal control operations strategies. The manual provides guidelines on design and installation techniques that require minimal maintenance, contains helpful suggestions for maintenance personnel, and addresses staffing and budgeting issues.

Cost: \$50 for members of the Institute of Transportation Engineers (ITE); \$62.50 for nonmembers

To Access This Resource: Contact the ITE Bookstore, <http://www.ite.org/bookstore/index.asp>, (202) 289-0222 x130, fax: (202) 289-7722, publications@ite.org.



Metropolitan Transportation Management Center—Concepts of Operations: A Cross-Cutting Study (FHWA-JPO-99-020/FTA-TRI-11-99-10) (1999)

This report, one in a series designed to educate public sector managers about particular ITS technologies, examines how several locations across North America are designing, installing, and operating transportation management centers (TMCs).

The report discusses successful practices and lessons learned in training, documentation, staffing, coordination (within agencies, between agencies, and with the media), and maintenance, design, and procurement. The study stresses the importance of documenting the common understanding of all partners in the design, implementation, operation, and maintenance of the TMC in a concept of operations.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/10923.pdf.



Metropolitan Transportation Management Center—Concepts of Operations: Case Studies (1999)

These reports are part of a series designed to educate public sector managers about particular ITS technologies. These case studies present the particular choices made in the design, implementation, operations, and maintenance of eight metropolitan transportation management centers across North America.

Cost: Free

To Access This Resource: Access the following website addresses:

- Arizona TrailMaster (FHWA-OP-99-010/FTA-TRI-11-99-15):
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/10943.pdf,
EDL# 10943
- Boston Central Artery/Tunnel Integrated Project Control System (FHWA-OP-99-003/FTA-TRI-11-99-16):
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/11063.pdf,
EDL# 11063
- COMPASS (FHWA-OP-99-004/FTA-TRI-11-99-17):
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/10944.pdf,
EDL# 10944
- Houston TranStar (FHWA-OP-99-005/FTA-TRI-11-99-18):
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/10963.pdf,
EDL# 10963
- Long Island INFORM (FHWA-OP-99-006/FTA-TRI-11-99-19):
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/10983.pdf,
EDL# 10983

- Michigan Intelligent Transportation Systems (FHWA-OP-99-007/FTA-TRI-11-99-20):
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/11103.pdf,
EDL# 11103
- Milwaukee MONITOR (FHWA-OP-99-008/FTA-TRI-11-99-21):
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/11123.pdf,
EDL# 11123
- Georgia NaviGAtor (FHWA-OP-99-009/FTA-TRI-11-99-22):
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/11124.pdf,
EDL# 11124



Metropolitan Transportation Management Center—Concepts of Operation: Implementation Guide (FHWA-OP-99-029/FTA-TRI-11-99-23) (1999)

This report is one in a series designed to provide public sector project managers with practical “how to” advice on the implementation of selected ITS technologies. This report examines several aspects of metropolitan transportation management centers (TMCs), including the rationale of building a TMC and the different types and functions of a TMC. The report presents choices that many agencies have faced when building or expanding a TMC—such as manual versus automated operation and in-house versus outsourced staffing—and discusses the advantages and disadvantages of each option. The report stresses the importance of documenting the common understanding of all partners of the design, implementation, operation, and maintenance of the TMC in a concept of operations.

Cost: Free

To Access This Resource: Access the website address
http://www.itsdocs.fhwa.dot.gov/jpodocs/rept_mis/11494.pdf.



Transportation Security Points-of-Contact

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- Dave Helman, FHWA Office of Transportation Operations, (202) 366-8042, David.Helman@dot.gov
- Mike Onder, FHWA Office of Freight Management and Operations, (202) 366-2639, Michael.Onder@dot.gov
- Henry Lieu, FHWA Office of Research, Development and Technology, (202) 493-3273, Henry.Lieu@dot.gov
- Greg Jones, FHWA Resource Center, (404) 562-3906, GregM.Jones@dot.gov
- Jeff Loftus, FMCSA Office of Analysis, Research and Technology, (202) 385-2363, Jeff.Loftus@dot.gov
- Amy Houser, FMCSA Office of Analysis, Research and Technology, (202) 385-2382, Amy.Houser@dot.gov
- Joe Delorenzo, FMCSA Midwestern Service Center, (708) 283-3572, Joseph.Delorenzo@dot.gov

<http://>

Emergency Transportation Operations Section of the FHWA Office of Operations Website

This website is a compilation of information related to emergency transportation operations. The website contains links to numerous publications in the areas of emergency prevention (i.e., transportation security), preparedness, response, recovery, and military deployment. The website also contains a list of high-profile emergency evacuations from around the world.

Cost: Free

To Access This Resource: Access the website address <http://www.ops.fhwa.dot.gov/opssecurity/index.htm>.

http://

FTA's Safety & Security Website

This site is a compilation of resources related to safety and security of all aspects of public transportation. Sponsored by the FTA Office of Safety & Security, the site contains listings of publications, training courses, and upcoming conferences. Topics addressed include rail safety, bus safety, emergency management, fire safety, and human factors, as well as the Drug and Alcohol Management Information Statistics (DAMIS) and Safety Management Information Statistics (SAMIS) programs. In response to the terrorist attacks on the World Trade Center and Pentagon on September 11, 2001, the site includes a "Dear Colleague" letter from the FTA Administrator outlining public transportation security resources which FTA has made available or which are in development. Available transit security resources include a one-page primer on lessons learned by transit agencies in emergency response in New York City and Washington, DC; a registration form to sign up for a mailing list with information on upcoming security awareness and training workshops; and a transit security survey that FTA is asking the members of the community to fill out. The "Dear Colleague" letter also describes a Safety and Security Tool Kit containing several key transit security publications and other resources mailed to transit agencies in October 2001.

Cost: Free

To Access This Resource: Access the website address <http://transit-safety.volpe.dot.gov>.

http://

FMCSA's Motor Carrier Security Website

This site is a compilation of resources developed to help law enforcement and commercial vehicle owners and operators to maintain motor carrier security, especially the secure shipment of hazardous materials (HAZMAT). Reference documents available on the website include: a guide to developing a hazmat security plan, list of steps that should be taken by hazmat workers and companies in light of the current threat advisory level as determined by the Department of Homeland Security (DHS), anti-terrorism and anti-hijacking tips for hazmat drivers and companies, a flier issued by the Federal Bureau of Investigation (FBI) "If you receive a suspicious letter or package, what you

should do,” a checklist that law enforcement can use to perform a security assessment of a commercial vehicle operator, and a form to request free FMCSA training in motor carrier security risk assessment. The site also contains related links, including the National Hazardous Material Route Registry (NHMRR).

Cost: Free

To Access This Resource: Access the website address <http://www.fmcsa.dot.gov/safety-security/security/index.asp>.

[http://](#)

Association of American State Highway and Transportation Officials' Special Committee on Transportation Security Website

This site is the official website of the Association of American State Highway and Transportation Officials' (AASHTO) Special Committee on Transportation Security. The site is a compilation of resources focusing on three particular aspects of transportation security: physical features of the highway system, information systems used to manage traffic operations, and commercial vehicle operations. The site contains key materials related to the task force, including its charge, membership roster, action items, and target dates for completing these actions. The site also includes a compilation of key transportation security documents, points-of-contact, and related links.

Cost: Free

To Access This Resource: Access the website address <http://security.transportation.org>.

[http://](#)

Institute of Transportation Engineers' Transportation Security Website

This site is a compilation of resources available to help transportation professionals respond to transportation security emergencies. The site contains articles, assessment tools, planning guides, case studies, and slide shows, as well as seminars, workshops, and other training opportunities related to transportation security. The “Safety and Security” section of the website contains resources highlighting the relationship

between traffic incident management, public safety, and emergency preparedness and includes example documents from Washington State and the District of Columbia, as well as guidance documents from the Federal Emergency Management Agency (FEMA).

Cost: Free

To Access This Resource: Access the website address <http://www.ite.org/security/index.asp>.



Communicating with the Public Using ATIS During Disasters—A Guide for Practitioners (FHWA-HOP-07-068) (2007)

This report documents the findings of a study on the dissemination of traveler information during disasters, both natural (e.g., hurricanes, earthquakes, avalanches, and fires) and man-made (e.g., hazardous material spills and terrorist attacks). The report explores what information needs to be communicated to evacuees and other travelers during disaster conditions and how Advanced Traveler Information Systems (ATIS) can be used to deliver such information most effectively. The use of ATIS during actual disasters in California, Georgia, Nevada, Utah, and Washington State is profiled in this report. The report presents a concept of operations that characterizes the flow of information among people, organizations, and technologies and recommends developing a local strategy for using ATIS during disasters. The report concludes with a toolkit for conducting a workshop among key stakeholders to develop such a strategy.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/publications/atis/atis_guidance.pdf
- HyperText Markup Language (HTML) format: <http://www.ops.fhwa.dot.gov/publications/atis/index.htm>



Simplified Guide to the Incident Command System for Transportation Professionals (FHWA-HOP-06-004/ FHWA-NHI-06-007) (2006)

This guide provides an introduction to the Incident Command System, a systematic tool used for the command, control, and coordination of emergency response. ICS allows agencies to work together using common terminology and operating procedures for controlling personnel, facilities, equipment, and communications at a single incident scene. ICS is part of a broader incident management system as outlined in the Department of Homeland Security's National Incident Management System (NIMS). Topics covered in the guide include ICS organizational structure, characteristics of unified command, strategies and tools that support the development of an ICS framework for day-to-day highway incident management, considerations for the on-scene management of highway incidents, and the benefits of ICS. The guide also summarizes NIMS requirements for resource management, communications, and information management.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/publications/ics_guide/ics_guide.pdf
- HyperText Markup Language (HTML) format: http://www.ops.fhwa.dot.gov/publications/ics_guide/index.htm



Effects of Catastrophic Events on Transportation Systems Management and Operations (2002-2004)

This series of reports explores the effects of catastrophic events on transportation systems management and operations. Six case studies examine how transportation systems operators responded to challenges created by recent catastrophic events in the U.S.: the Northridge earthquake in the Los Angeles, California area in 1994, a rail tunnel fire involving hazardous materials in Baltimore in 2001, the terrorist attacks on the World Trade Center and the Pentagon on September 11, 2001, and the blackout in New York

City and the Great Lakes Region in 2003. An Executive Summary report on the 2003 blackout is available, as well as a cross-cutting study that documents the lessons learned from the events prior to 2002 and a comparative analysis that document lessons learned from all these events.

Cost: Free

To Access This Resource: Access the following website addresses:

- Northridge Earthquake, January 17, 1994 (2002)—Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13775_files/13775.pdf
- Northridge Earthquake, January 17, 1994—HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13775.html, EDL# 13775
- Howard Street Tunnel Fire, Baltimore City, Maryland July 18, 2001 (2002)—Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13754_files/13754.pdf
- Howard Street Tunnel Fire, Baltimore City, Maryland July 18, 2001—HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13754.html, EDL# 13754
- September 11, 2001: Pentagon (2002)—Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14119_files/14119.pdf
- September 11, 2001: Pentagon—HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14119.htm, EDL# 14119 or http://www.ops.fhwa.dot.gov/opssecurity/case_studies/pentagon911.htm
- September 11, 2001: World Trade Center (2002)—Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14129_files/14129.pdf
- September 11, 2001: World Trade Center—HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14129.htm, EDL# 14129 or http://www.ops.fhwa.dot.gov/opssecurity/case_studies/nycprelim.htm

- August 2003 Northeast Blackout: Great Lakes Region (2004)
—Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14021.pdf
- August 2003 Northeast Blackout: Great Lakes Region—
HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14021.htm, EDL# 14021
- August 2003 Northeast Blackout: New York City (2004)—
Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14023.pdf
- August 2003 Northeast Blackout: New York City—HyperText
Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14023.htm, EDL# 14023
- August 2003 Northeast Blackout: Executive Summary (2004)
—Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14022_files/14022.pdf
- August 2003 Northeast Blackout: Executive Summary—
HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14022.htm, EDL# 14022
- Cross-Cutting Study (2002)—Adobe Acrobat format:
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13780_files/13780.pdf
- Cross-Cutting Study—HyperText Markup Language format:
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13780.html,
EDL# 13780
- Comparative Analysis (2004)—Adobe Acrobat format:
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14024.pdf
- Comparative Analysis—HyperText Markup Language format:
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14024.htm,
EDL# 14024



Recommendations for Bridge and Tunnel Security (2003)

The report contains the recommendations of a Blue Ribbon Panel (BRP), sponsored jointly by the FHWA and the American Association of State Highway and Transportation Officials (AASHTO). The BRP—composed of bridge and tunnel experts from professional practice, academia, Federal and state agencies, and toll authorities—was charged with examining bridge and

tunnel security and developing strategies for deterring, disrupting, and mitigating potential terrorist attacks on bridges and tunnels. In the report, the BRP shows how the nation's bridges and tunnels are vulnerable to terrorist attacks. This report recommends policies and actions to reduce the probability of catastrophic structural damage that could result in substantial human casualties, economic losses, and sociopolitical damage.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://security.transportation.org/sites/security/brpt/brp.pdf>
- HyperText Markup Language (HTML) format: <http://security.transportation.org/sites/security/brpt/brptoc.asp>



The National Strategy for the Physical Protection of Critical Infrastructures and Key Assets (2003)

This document identifies national goals, objectives, guiding principles, and specific actions to protect critical infrastructure and key assets in the U.S. from terrorist attack. This document stresses that homeland security, unlike national security that is almost entirely a Federal responsibility, is a cooperative effort among Federal, state, and local governments, the private sector, and individuals. The section on transportation infrastructure lists challenges and initiatives specific to aviation, rail, pipelines, maritime, highway, trucking, and bus modes.

Cost: Free

To Access This Resource: Access the website address http://www.dhs.gov/xlibrary/assets/Physical_Strategy.pdf.



A Guide to Highway Vulnerability Assessment for Critical Asset Identification and Protection (2002)

This guide was developed as a tool for state departments of transportation to assess the vulnerabilities of their physical transportation assets (such as bridges and tunnels), develop

countermeasures to detect, deter, and delay the consequences of terrorist threats to these assets, estimate the capital and operating costs of such countermeasures, and improve operational planning for transportation security.

Cost: Free

To Access This Resource: Access the following website addresses:

- Full Report: http://security.transportation.org/sites/security/docs/guide-VA_FinalReport.pdf
- Appendices: http://security.transportation.org/sites/security/docs/guide-VA_Appendices.pdf



Electronic Cargo Seals: Context, Technologies and Marketplace (2002)

This paper provides an overview of the current marketplace for electronic cargo seals. The paper examines the motivation for using electronic seals, the expectations of users, and the characteristics of such seals. In matrix format, the paper lists key characteristics of 20 electronic seals and locks, offered by 24 firms, representing four key technology types: radio frequency identification (RFID), infrared, remote communications, and very-short-range or contact technologies.

Cost: Free

To Access This Resource: Access the website address http://www.ops.fhwa.dot.gov/freight/publications/eseal_wp_final_july12/eseal_wp_final_01.htm.



Homeland Security and ITS: Using Intelligent Transportation Systems to Improve and Support Homeland Security (2002)

This 30-page report serves both as formal advice from the Intelligent Transportation Society of America (ITS America) to the U.S. Department of Transportation and as a supplement to *The National Intelligent Transportation Systems Program Plan: A Ten-Year Vision* focusing on homeland security. This supplement reiterates ITS America's vision for the future while it updates the

Program Plan's goal regarding transportation security, assesses the opportunities for the ITS community to address homeland security issues, including challenges and projected benefits, identifies research, program, and institutional actions necessary to overcome challenges and experience the benefits, and suggests appropriate roles for a broad range of stakeholders.

Cost: Free

To Access This Resource: Access the website address <http://www.itsa.org/itsa/files/pdf/Homeland%20Security%20Supplement.pdf>. To order a hardcopy, contact David Ridgley, ITS America, (202) 721-4228, DRidgley@itsa.org.



Security and Emergency Response Survey of State Transportation Agencies: Preliminary Results (2002)

This document presents the results of a survey of state transportation agencies taken in the fall of 2001 regarding their security and emergency response capabilities and resources. Sponsored jointly by the Association of American State Highway and Transportation Officials (AASHTO) Task Force on Transportation Security and the Transportation Research Board's Task Force on Critical Infrastructure Protection, among the survey's many conclusions is that while 98 percent of respondents have emergency response plans for natural disasters, only 70 percent have plans for terrorist attacks. The presentation also identifies areas of research and technical assistance in transportation security that are the highest priorities for state departments of transportation.

Cost: Free

To Access This Resource: Access the website address http://security.transportation.org/sites/security/docs/Security_Emergency.pdf.



Protecting Our Transportation Systems: An Information Security Awareness Overview (FHWA-JPO-98-005) (1997)

This report provides an overview of information security from an ITS perspective. The report explains the importance of being concerned about information security threats. The report recounts news stories from around the world on how information security violations have damaged the public and private sector's ability to provide ITS products and services. Finally, the report describes technical and non-technical solutions to these problems. The report also contains frequently asked questions (with answers), a detailed bibliography, and contact information for organizations that are resources on information security.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/3243.pdf.



System Security Awareness and Security Incident Management

This series of four courses is designed to help transit systems better handle a potential terrorist incident as well as improve their security and reduce crime on their properties. Participants will learn how to improve their innate common sense abilities to observe, determine, and report people and things that are suspicious or out of place. Separate courses are available for employees of commuter railroads, passenger vessels, transit and transportation agencies. The course emphasizes prioritizing actions that must be taken at the scene of a threat or incident. Target Audience: Frontline employees and supervisors who have direct contact with the public for the vehicles and facilities used by the public. A train-the-trainer option for all four courses is available. Course Length: Three to four hours for the regular version; five to six hours for the train-the-trainer version.

Cost: Free

To Access This Resource: Access the following website addresses:

- System Security Awareness for Commuter Railroad Employees: <http://www.ntionline.com/CourseInfo.asp?CourseNumber=SA001a>
- System Security Awareness for Passenger Vessel Employees: <http://www.ntionline.com/CourseInfo.asp?CourseNumber=SA001>
- System Security Awareness for Transit Employees: <http://www.ntionline.com/CourseInfo.asp?CourseNumber=WP028i>
- System Security Awareness for Transportation Employees: <http://www.ntionline.com/CourseInfo.asp?CourseNumber=SA005>
- Alternatively, contact Colleen Meyer, National Transit Institute, (732) 932-1700 x231, CMeyer@rutgers.edu. Agencies can request that the course be customized for employees. To download the request form, access the website address <http://www.ntionline.com/documents/CFRWEB.pdf>.



Travel Demand Management Points-of-Contact

- Wayne Berman, FHWA Office of Transportation Management, (202) 366-4069, Wayne.Berman@dot.gov
- Allen Greenberg, FHWA Office of Transportation Management, (202) 366-2425, Allen.Greenberg@dot.gov
- Grant Zammit, FHWA Resource Center, (404) 562-3575, Grant.Zammit@dot.gov

<http://>

Travel Demand Management Section of the FHWA Office of Operations Website

This website is a compilation of resources related to travel demand management. The site contains reference documents, training opportunities, points-of-contact, and related links.

Cost: Free

To Access This Resource: Access the website address <http://www.ops.fhwa.dot.gov/tdm/index.htm>.



Commuter Choice Decision Support System

This software provides an interactive way to design a commuter choice program that meets the specific needs and characteristics of an employment site. Building upon traditional travel demand management (TDM) strategies, the software allows employers to take advantages of the full spectrum of commute options, including how commuters get to work (mode choice), when they travel (time choice), where they work (location choice), and which way they travel (route choice).

Cost: Free

To Access This Resource: The Commuter Choice Decision Support System software is available when ordering a hardcopy of the document *Commuter Choice Primer: An Employer's Guide For Implementing Effective Commute Choice Programs*. To order the document and CD-ROM package, contact the Operations/ITS Helpline, (866) 367-7487 or itspubs@dot.gov.



Managing Demand Through Travel Information Services (FHWA-OP-05-005) (2005)

This report explores the opportunities and benefits of using traveler information services to manage traveler demand during periods of severe congestion. Three different types of travel demand situations are examined: (1) commuting to and from work, (2) predictable situations such as work zones, planned special events, tourism, and parking management, and (3) less predictable situations such as incidents, adverse weather conditions, hurricanes and other catastrophic events. Scattered throughout the report are examples of the traveler information technologies that states and municipalities across the U.S. are using to manage traveler demand, including websites, dedicated TV channels, dynamic message signs, e-mail alert services, “next bus” signs, and “smart park” systems. The report concludes with lessons learned and a discussion of the future direction of traveler information and its implications for managing travel demand.

Cost: Free

To Access This Resource: Access the website address http://www.ops.fhwa.dot.gov/publications/manag_demand_tis/travelinfo.htm.



Mitigating Traffic Congestion—The Role of Demand-Side Strategies (FHWA-OP-05-001) (2004)

This report presents a framework for reducing demand on the transportation system—instead of increasing supply—to improve its performance. The basis of the demand management framework is to present travelers with choices about all aspects of their journey: mode, departure-time, route, final destination, and even whether or not to make the trip at all. The report also presents 26 case studies on how states, municipalities, facility operators, and other organizations are applying the framework to manage travel demand. Organizations profiled in the case studies include universities, sports and entertainment facility operators, and popular tourist destinations. Strategies employed by case

study subjects include corridor-wide transportation planning, construction mitigation, employer-based commute programs, transit-oriented and mixed-use development, variable pricing, and advanced traveler information.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/publications/mitig_traf_cong/mitig_traf_cong.pdf
- HyperText Markup Language (HTML) format: http://www.ops.fhwa.dot.gov/publications/mitig_traf_cong/index.htm



Travel Demand Management (FHWA-OP-04-041) (2004)

This flier explores the history of travel demand management (TDM), showing how modern TDM differs from original TDM concepts proposed in the 1970s and 1980s. Managing travel demand today means providing all travelers—regardless of whether they carpool or drive alone—with choices of location, route, and time in addition to mode of travel. The flier presents a model that divides TDM into two distinct types: work commute travel and non-commute travel such as tourism, special events, emergencies, and construction. The flier explores the technologies that enable TDM, many of which are part of ITS. The flier concludes with a discussion of resources that the FHWA Office of Operations is developing to help agencies implement TDM programs.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/aboutus/one_pagers/demand_mgmt.pdf
- HyperText Markup Language (HTML) format: http://www.ops.fhwa.dot.gov/aboutus/one_pagers/demand_mgmt.htm



A Guide for HOT Lane Development (FHWA-OP-03-009) (2003)

This guide provides information on a wide range of policy and technical issues associated with high-occupancy toll (HOT) lanes, and focuses on how these activities are likely to differ from those associated with more traditional highway improvements. This guide includes case studies of the four existing HOT lane facilities in the U.S., as well as two recent HOT lane studies that are indicative of current trends.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13668_files/images/13668.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13668.html, EDL# 13668



Commuter Choice Primer: An Employer's Guide for Implementing Effective Commute Choice Programs (FHWA-OP-03-007) (2003)

This document shows employers how to apply travel demand management (TDM) strategies to help alleviate transportation problems affecting the worksite, such as congestion, accessibility, parking, and mobility. Building upon traditional TDM strategies, the document introduces the broader concept of commuter choice, which includes the full spectrum of travel options: how commuters get to work (mode choice), when they travel (time choice), where they work (location choice), and which way they travel (route choice). The hardcopy also contains the Commuter Choice Decision Support System software on CD-ROM.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS HelpLine, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_pr/13669/CommuterChoicePrimer.pdf
- HyperText Markup Language (HTML) format:
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_pr/13669.html,
EDL# 13669



Traveler Information Points-of-Contact

- Benjamin McKeever, ITS Joint Program Office, (202) 366-4876, Ben.McKeever@dot.gov
- Bob Rupert, FHWA Office of Transportation Management, (202) 366-2194, Robert.Rupert@dot.gov
- Jimmy Chu, FHWA Office of Transportation Management, (202) 366-3379, Jimmy.Chu@dot.gov
- James Pol, FHWA Office of Transportation Management, (202) 366-4374, James.Pol@dot.gov
- Mac Lister, FHWA Resource Center, (708) 283-3532, Mac.Lister@dot.gov
- Charlene Wilder, FTA Service Innovation Division, (202) 366-1077, Charlene.Wilder@dot.gov



Real-Time Traveler Information Program Section of the FHWA Office of Operations Website

This website is a compilation of resources for the Traveler Information program, including 511—America's Traveler Information Telephone Number. These resources focus on all aspects of traveler information: how the information is collected, how it is processed, how it is provided to travelers, and how transportation system operators may use it. The website links to practitioner tools and resources and showcases the National Traffic and Road Closure Information database. The website also contains informational and other related links.

Cost: Free

To Access This Resource: Access the website address <http://ops.fhwa.dot.gov/TravelInfo/index.htm>.

http://

National Traffic and Road Closure Information Website

This website is a compilation of traveler information websites for traffic and road closure information. The website shows a U.S. map that serves as a portal to traffic information and road closure websites sponsored by the state departments of transportation and other public and private organizations. The site also links to national and regional websites with construction, weather, and traffic information.

Cost: Free

To Access This Resource: Access the website address

<http://www.fhwa.dot.gov/trafficinfo/index.htm>.

http://

511 Travel Information Telephone Services Section of the FHWA Office of Operations Website

This website is a compilation of resources related to 511—the national three-digit traveler information number designated by the Federal Communications Commission (FCC) in 2000. The website provides information about the status of 511 deployment, including the 511 Planning Assistance Program that provided Federal funding to help states develop approaches to implementation. The website shows a map with states color-coded by their status of 511 deployment. The website also includes links and “backdoor” telephone numbers to active 511 systems, so that users can hear how the various services function.

Cost: Free

To Access This Resource: Access the website address

<http://www.ops.fhwa.dot.gov/511/index.htm>.

http://

511 Deployment Coalition Website

The 511 Deployment Coalition is a partnership between the U.S. DOT and several professional associations representing state departments of transportation (DOTs), public transportation agencies, and the private sector. This website is a compilation of resources related to 511 gathered by Coalition members,

including a map showing the current state-by-state status of 511 deployment across the U.S., materials and tips on how to market a 511 service, implementation guidelines, guidelines on how to evaluate the success of a 511 service, and evaluation results showing usage statistics. The website also contains Coalition reports and minutes of Coalition general membership and subgroup meetings. The contacts section provides contact information for all participating state DOTs, the member professional associations and U.S. DOT, as well as instructions on how to join a Yahoo^(R) discussion group that focuses on 511 deployment issues. The links section provides links to the 511 websites of all participating state DOTs.

Cost: Free

To Access This Resource: Access the website address <http://www.deploy511.org>.



Advanced Parking Management Systems: A Cross-Cutting Study (FHWA-JPO-07-011) (2007)

This report is one in a series designed to educate public sector managers about particular ITS technologies. This report explains how ITS technologies can be used to inform travelers about where the best parking locations are, what hours they are open, what fees they charge, and, most importantly, whether a parking space will be available when they arrive. This report presents the full range of advanced parking management systems (APMS) technologies, from low-tech solutions such as a parking information website to cutting-edge parking reservation systems that enable drivers to locate, reserve, and pay for a parking space, all through wireless communications. The report profiles advanced parking management systems in Washington State, Illinois, and Maryland. The study concludes with a summary of the benefits and costs of this new technology, as well as lessons learned in the areas of policy and planning, design and deployment, and management and operations.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS HelpLine, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14318_files/14318.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14318.htm, EDL# 14318



Communicating with the Public Using ATIS During Disasters—A Guide for Practitioners (FHWA-HOP-07-068) (2007)

This report documents the findings of a study on the dissemination of traveler information during disasters, both natural (e.g., hurricanes, earthquakes, avalanches, and fires) and man-made (e.g., hazardous material spills and terrorist attacks). The report explores what information needs to be communicated to evacuees and other travelers during disaster conditions and how Advanced Traveler Information Systems (ATIS) can be used to deliver such information most effectively. The use of ATIS during actual disasters in California, Georgia, Nevada, Utah, and Washington State is profiled in this report. The report presents a concept of operations that characterizes the flow of information among people, organizations, and technologies and recommends developing a local strategy for using ATIS during disasters. The report concludes with a toolkit for conducting a workshop among key stakeholders to develop such a strategy.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/publications/atis/atis_guidance.pdf
- HyperText Markup Language (HTML) format: <http://www.ops.fhwa.dot.gov/publications/atis/index.htm>



Intelligent Transportation Systems for Traveler Information: Deployment Benefits and Lessons Learned (FHWA-JPO-07-002) (2007)

This leaflet is one in a series that shows how ITS technologies can reduce congestion in support of the U.S. Department of Transportation's Congestion Initiative. This leaflet summarizes the benefits, costs, extent of deployment, and lessons learned about the use of ITS for providing accurate, and timely traveler information. The online version contains a full list of sources, so that all information in the leaflet's brief four pages is backed up with supporting documentation.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS Helpline, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.its.dot.gov/jpodocs/repts_te/14319_files/14319.pdf
- HyperText Markup Language (HTML) format: http://www.its.dot.gov/jpodocs/repts_te/14319.htm, EDL# 14319



Profiles of 511 Traveler Information Services: Update 2007 (2007)

This document profiles 34 traveler information systems that use the national traveler information telephone number 511. This report highlights areas of information delivery these systems share and identifies those pieces of traveler information unique to specific systems. Of the 34 systems profiled, 31 have co-branded websites; 18 provide public transit information; and nine automatically transfer a caller, if requested, to a transit provider. This is the second edition of this report. This edition profiles all 511 traveler information services operating in the U.S. as of July 2007.

Cost: Free

To Access This Resource: Access the website address http://www.fta.dot.gov/documents/511_PROFILES_TOC-A_2007.doc.



Real-time Traveler Information Services Business Models: State of the Practice Review (FHWA-HOP-07-115) (2007)

This report documents the findings of a state-of-the-practice review of business models employed in the provision of traveler information services. In addition, this report provides real-world examples of how states and regions are developing partnerships and business plans within common business model frameworks. Common traveler information business models profiled in this report include public sector-funded operations, franchise operations, private sector-funded and -operated systems, value-added resellers, and business-to-business operations. This report explores roles and responsibilities assumed by different stakeholders and advantages and disadvantages of the various models. Case studies of various types of traveler information business models are included throughout the report.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/publications/rtis_busmodels/rtis_busmodels.pdf
- HyperText Markup Language (HTML) format: http://www.ops.fhwa.dot.gov/publications/rtis_busmodels/index.htm



Priority, Market-Ready Technologies and Innovations: 511 Traveler Information (2006)

This brochure provides a broad overview of 511 systems, describes the problem 511 was designed to address, and discusses what Federal assistance is available to deploy 511, how a typical 511 program works, how a typical 511 program is funded, and the national 511 deployment goal and current status (as of 2006) towards reaching that goal. The brochure concludes with a listing of helpful websites and Federal points-of-contact.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://www.fhwa.dot.gov/crt/marketready/511traveler.pdf>
- HyperText Markup Language (HTML) format: <http://www.fhwa.dot.gov/crt/lifecycle/511.cfm>



Final Report: Model Deployment of a Regional Multi-Modal 511 Traveler Information System (2005)

This report documents the findings of an evaluation of a model deployment of the 511 telephone information system in Phoenix, Arizona. The 511 system tested in Phoenix included several enhancements over traditional 511 technologies, including voice recognition, automated operation for common information requests, and provision of information on major transportation events such as incidents, construction, transit service disruptions, special events, and abnormal weather conditions. The report concludes with recommendations based on lessons learned in the areas of voice recognition, marketing, partnerships, and feedback from users.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14248_files/14248.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14248.htm, EDL# 14248



Implementation and Operational Guidelines for 511 Services Version 3.0 (2005)

These guidelines were designed to assist those wishing to implement and operate a three-digit traveler information number—511—as the main traveler information number in their region. The guidelines emphasize development of high-quality

traveler information systems and compatibility with 511 systems nationwide. The guidelines also address two key aspects of service quality: content and consistency.

Cost: Free

To Access This Resource: Access the website address <http://www.deploy511.org/docs/511%20Guidelines%20Version%203.0.pdf>.



Managing Demand Through Travel Information Services (FHWA-OP-05-005) (2005)

This report explores the opportunities and benefits of using traveler information services to manage traveler demand during periods of severe congestion. Three different types of travel demand situations are examined: (1) commuting to and from work, (2) predictable situations such as work zones, planned special events, tourism, and parking management, and (3) less predictable situations such as incidents, adverse weather conditions, hurricanes and other catastrophic events. Scattered throughout the report are examples of the traveler information technologies that states and municipalities across the U.S. are using to manage traveler demand, including websites, dedicated TV channels, dynamic message signs, e-mail alert services, “next bus” signs, and “smart park” systems. The report concludes with lessons learned and a discussion of the future direction of traveler information and its implications for managing travel demand.

Cost: Free

To Access This Resource: Access the website address http://www.ops.fhwa.dot.gov/publications/manag_demand_tis/travelinfo.htm.



Travel Time Messaging Case Studies (2005)

These case studies examine how four locations in the U.S. provide travel time messages on dynamic message signs. The case studies document the decision processes, system configuration, travel time calculation algorithms, and lessons learned.

Cost: Free

To Access This Resource: Access the following website addresses:

- Chicago: http://www.ops.fhwa.dot.gov/publications/travel_time_study/chicago/chicago_ttm.htm
- Houston: http://www.ops.fhwa.dot.gov/publications/travel_time_study/houston/houston_ttm.htm
- Nashville: http://www.ops.fhwa.dot.gov/publications/travel_time_study/nashville/nashville_ttm.htm
- Portland, Oregon: http://www.ops.fhwa.dot.gov/publications/travel_time_study/portland/portland_ttm.htm



AMBER, Emergency, and Travel Time Messaging Guidelines for Transportation Agencies (2004)

This report provides guidelines to transportation agencies on the content of dynamic message signs (DMS), specifically related to America's Missing: Broadcast Emergency Response (AMBER) alerts, emergency situations, and travel times. The guidelines are based on a review of current practice by transportation agencies from around the country. The report appendices contain the results of a survey conducted among transportation agencies, as well as an annotated bibliography on DMS usage.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/TravelINfo/resources/cms_rept/cmspractices.pdf
- HyperText Markup Language (HTML) format: http://www.ops.fhwa.dot.gov/TravelINfo/resources/cms_rept/cmspractices.htm



The Evaluation of Advanced Traveler Information Services (ATIS) Impacts on Truck Travel Time Reliability (2004)

This report evaluates the ability of advanced traveler information systems (ATIS) to improve the on-time reliability of commercial vehicles in an urban setting. The evaluation uses the Heuristic

On-Line Web-Linked Arrival Time Estimation (HOWLATE) simulation model to evaluate the impacts of ATIS on freight movements at an international terminal in Los Angeles, California. The study provides dollar value estimates of the benefits of ATIS and concludes that for commercial vehicle operators with stringent on-time requirements who face considerable travel time variability ATIS is a useful and high-value service.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13988_files/13988.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13988.html, EDL# 13988



Traveler Information and Tourism: Assessment of Traveler Information and 511 Impacts on Tourist Destinations and National Parks (2004)

This report documents the findings of a study that examined the impact of traveler information on four tourist areas: Acadia National Park in Maine; Branson, Missouri; the I-81 Corridor in the Shenandoah Valley of Virginia; and Salt Lake City, Utah. The report examines the impacts of traveler information at each of the four sites in depth and then concludes with cross-cutting findings and recommendations on how to improve traveler information operations in tourist areas.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14054_files/14054.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14054.htm, EDL# 14504



Understanding Key Tradeoffs for Cost-Effective Deployment of Surveillance to Support Advanced Traveler Information Systems (ATIS) (2004)

This report presents the findings of research, conducted through simulation models, into two types of transportation surveillance investments, and compares the relative costs and benefits for use in advanced traveler information systems (ATIS). The two types of investments are: expansion of surveillance coverage to include additional miles of roadway, and improvement in the accuracy of the information provided on roadways already covered by surveillance. The research concludes that the point at which the benefits of additional investment no longer exceed the costs is 50 to 60 percent of full network coverage for increasing coverage and a 5 percent error rate for increasing accuracy.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13991_files/13991.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13991.html, EDL# 13991.



511 America's Traveler Information Number Deployment Assistance Reports (2002-2003)

This series of reports was published by the 511 Deployment Coalition to provide both technical and institutional information to agencies considering, planning, or implementing 511 systems. The reports address issues such as business models, linkages with public safety and homeland security, regional interoperability, and several different types of 511 content, including public transportation, weather information, and roadway conditions.

Cost: Free

To Access This Resource: Access the following website addresses:

- Report #1: Business Models and Cost Considerations (2002)—Adobe Acrobat format: <http://www.its.dot.gov/511/PDF/511bmCst.pdf>
- Report #1: Business Models and Cost Considerations—HyperText Markup Language (HTML) format: http://www.its.dot.gov/511/511_Costs.htm
- Report #2: Transfer of 511 Calls to 911 (2002): <http://www.its.dot.gov/511/511to911.htm>
- Report #3: 511 and Homeland Security (2002)—Adobe Acrobat format: <http://www.its.dot.gov/511/PDF/511secur.pdf>
- Report #3: 511 and Homeland Security—HyperText Markup Language format: <http://www.its.dot.gov/511/511secur.htm>
- Report #4: Regional Interoperability Issues (2003)—Adobe Acrobat format: <http://www.its.dot.gov/511/PDF/511inter.pdf>
- Report #4: Regional Interoperability Issues—HyperText Markup Language format: <http://www.its.dot.gov/511/511inter.htm>
- Report #5: Public Transportation Content on 511 Services (2003)—Adobe Acrobat format: <http://www.its.dot.gov/511/PDF/511ptrns.pdf>
- Report #5: Public Transportation Content on 511 Services—HyperText Markup Language format: <http://www.its.dot.gov/511/511ptrns.htm>
- Report #6: Weather and Environment Content on 511 Services (2003)—Adobe Acrobat format: <http://www.its.dot.gov/511/PDF/511weath.pdf>
- Report #6: Weather and Environment Content on 511 Services—HyperText Markup Language format: <http://www.its.dot.gov/511/511weath.htm>
- Report #7: Roadway Content Quality on 511 Services (2003)—Adobe Acrobat format: <http://www.its.dot.gov/511/PDF/511road.pdf>
- Report #7: Roadway Content Quality on 511 Services—HyperText Markup Language format: <http://www.its.dot.gov/511/511road.htm>



Guidance for Developing and Deploying Real-Time Traveler Information Systems for Transit (FTA-OH-26-7017-2003-1) (2003)

This document offers guidance to transit agencies on the development and deployment of real-time transit information systems. The report presents the current state-of-the-practice in real-time transit information systems, components of successful systems, deployment issues and challenges, recommended practices for successful deployment, and a look toward the future of this promising technology.

Cost: Free

To Access This Resource: Access the website address http://ntl.bts.gov/lib/23000/23600/23663/RTTIS_Final.pdf.



Traveler Information Systems in Europe (FHWA-PL-03-005) (2003)

This report presents the findings of the study team that participated in an International Technology Scanning Program tour of Spain, Germany, Sweden, Scotland, and England to learn about multimodal traveler information systems. Among the aspects of traveler information included in the report are information content, customer needs, business and cost recovery models, technology applications, consistency and standards, and legal and policy issues. The report concludes with recommendations for how European best practices can be applied in the U.S.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://international.fhwa.dot.gov/travelinfo/traveler_information.pdf
- HyperText Markup Language (HTML) format: <http://international.fhwa.dot.gov/travelinfo/index.htm>



511 Case Studies (2001)

These case studies examine the transition made by several states and regions to the nationally designated three-digit traveler information number—511—as the main traveler information number for the area. The case studies document progress made to date and conclude with lessons learned.

Cost: Free

To Access This Resource: Access the following website addresses:

- Arizona: <http://www.its.dot.gov/511/PDF/Arizona.pdf>
- Detroit, Michigan: http://www.its.dot.gov/511/Mich_cs.htm
- Kentucky: <http://www.its.dot.gov/511/PDF/Kentucky.pdf>
- Minnesota: http://www.its.dot.gov/511/Minn_cs.htm
- San Francisco: <http://www.its.dot.gov/511/Travinfo.htm>
- Utah CommuterLink: http://www.its.dot.gov/511/Utah_cs.htm
- Shenandoah Valley, Virginia: <http://www.its.dot.gov/511/travshen.htm>



Sharing Data for Public Information: Practices and Policies of Public Agencies (2002)

This report documents the current state-of-the-practice of public agencies sharing digital, video, and verbal forms of data and information about travel conditions. The particular aspects of a public agency's data-sharing practices can have a powerful effect on deployment of 511 telephone numbers and other types of traveler information services. This report describes how both the public and private sectors address the issues of data ownership and data sharing. This report also examines policies that seek to encourage data sharing and to improve the quality and quantity of information provided to travelers.

Cost: Free

To Access This Resource: Access the website address <http://ops.fhwa.dot.gov/travelinfo/resources/datashare/datashare.htm>.



511 for Traveler Information: Implementation Issues (2000)

This document provides state and local transportation agencies with an explanation of the Federal Communication Commission's (FCC) assignment of 511 as a three-digit nationwide telephone number for traveler information. The document explores the impacts of the FCC decision and of some key issues related to how a transportation agency would implement 511 in its own region. The document discusses potential involvement with telephone local exchange carriers (LECs), wireless communications carriers, and state regulatory agencies such as public utilities commissions (PUCs), state commerce commissions (SCCs), and public service commissions (PSCs).

Cost: Free

To Access This Resource: Access the website address <http://www.its.dot.gov/511/pdf/traveler.pdf>.



Summary of the Metropolitan Model Deployment Initiative (MMDI) Advanced Traveler Information Systems (ATIS) Symposium and ATIS Data Collection Guidelines Workshop (2000)

This document provides a summary of the Metropolitan Model Deployment Initiative (MMDI) Advanced Traveler Information Systems (ATIS) Symposium and ATIS Data Collection Guidelines Workshop, held February 8-10, 2000, in Scottsdale, Arizona. The symposium focused on the experiences of the MMDI in providing guidelines and recommendations to public sector agencies considering the deployment or improvement of their ATIS services. In addition, the symposium highlighted successful institutional approaches to ATIS deployment and best practices for the collection and dissemination of ATIS data. The online proceedings link to presentations given at the workshop, related white papers, and other reference documents.

Cost: Free

To Access This Resource: Access the website address http://www.ntoctalks.com/jpo/atIS_summ.html.



What Have We Learned about Intelligent Transportation Systems? Chapter 4: What Have We Learned about Advanced Traveler Information Systems and Customer Satisfaction? (2000)

This document is an excerpt from a compendium report that looks back on the 10 years of the National ITS Program to examine which ITS technology applications have been successful, which have not been successful, and what the underlying factors are that determine success versus failure. This section examines consumer acceptance of advanced traveler information systems (ATIS).

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13320.pdf, EDL# 13320.



Intelligent Transportation Systems Field Operational Test Cross-Cutting Study: Advanced Traveler Information Systems (FHWA-JPO-99-038) (1998)

This report summarizes and interprets the results of several field operational tests (FOTs) that tested advanced traveler information systems (ATIS). Topics covered include impacts, user response, technical lessons learned, institutional challenges and resolutions, and implementation costs.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/6323.pdf, EDL# 6323.



Strategies for Improved Traveler Information (TCRP Report# 92) (2003)

This report summarizes the state of the practice in the provision of advanced traveler information services (ATIS) to transit riders. This report identifies transit traveler information needs, assesses the

state of the art in providing transit traveler information, contains examples of customer information systems for both within and outside the transit industry, discusses transit traveler information as part of a larger continuum of information systems, and looks to the future of this promising new facet of the transit industry.

Cost: \$22 for the hardcopy version; the online version is free.

To Access This Resource: To order the hardcopy version, contact the Transportation Research Board (TRB) Bookstore at <http://www.trb.org/bookstore> and search for "TC092," (202) 334-3213, fax: (202) 334-2519. For the online version, access the website address http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_92.pdf.



Scheduled Lives, Stressful Drives (FHWA-OP-01-039) (2001)

This video shows how advanced traveler information systems (ATIS) empower travelers to use their time more effectively. The video also calls for new ways to measure performance of transportation networks that reflect time budgeting and ATIS. The target audience for the video includes transportation professionals as well as the general public.

Cost: Free

To Access This Resource: To order a copy of the video, contact the Operations/ITS HelpLine, (866) 367-7487 or itspubs@dot.gov.



Multimodal Traveler Information Systems

The course identifies the issues, requirements, recommendations, lessons learned and best practices of implementing and operating advanced traveler information systems (ATIS). The course discusses the different types of traveler information that ATIS can provide, including transit information, traffic information, and multimodal information, as well as various ATIS delivery mechanisms such as 511. The course explores how pre-trip information, including automated trip itinerary planning, differs from information that travelers want while en route. Participants will learn how to measure customer preferences and how to respond to what customers prefer. Finally, the course discusses relevant ITS standards and conformity with the National ITS Architecture.

Traveler Information

Cost: Free for Federal, state and local government employees; \$300 for contractors and consultants.

To Access This Resource: Access the website address <http://www.ntionline.com/CourseInfo.asp?CourseNumber=ID007A> or contact Susan Greenstone, National Transit Institute, (732) 932-1700 x219, SGreenstone@nti.rutgers.edu.



Work Zones Points-of-Contact

- Brian Cronin, ITS Joint Program Office, (202) 366-8841, Brian.Cronin@dot.gov
- Chung Eng, FHWA Office of Transportation Operations, (202) 366-8043, Chung.Eng@dot.gov
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- Deborah Curtis, FHWA Office of Research, Development and Technology, (202) 493-3267, Deborah.Curtis@dot.gov
- Daniel Grate, FHWA Resource Center, (404) 562-3912, Daniel.Grate@dot.gov
- Eric Ferron, FHWA Resource Center, (720) 963-3206, Eric.Ferron@dot.gov
- Ken Wood, FHWA Resource Center, (708) 283-4340, Ken.Wood@dot.gov



Work Zone Mobility and Safety Program Section of the FHWA Office of Operations Website

This site is the official website of the FHWA Office of Operations Work Zone Mobility and Safety Program. The website provides tools to transportation practitioners, including key reference documents, decision support tools, a featured innovative work zone practice that is updated monthly, and current work zone-related news items. The website also contains the full text of applicable Federal regulations and policies, statistics that make the case for improving safety and mobility in work zones, and related links.

Cost: Free

To Access This Resource: Access the website address <http://www.fhwa.dot.gov/workzones>.



Work Zone Safety and Mobility Peer-to-Peer Program

The Work Zone Safety and Mobility Peer-to-Peer Program provides a way for state and local agencies to get answers to their questions about work zones. The program quickly connects volunteers with expertise in specific work zone topics with professionals who need guidance. The peers are volunteers who are knowledgeable about a wide range of work zone topics, including the Final Rule, planning and programming, public relations/education/outreach, analysis tools, contracting and bidding procedures, traveler information, enforcement, incident management, evaluation, and ITS. Peers are eager to share their work zone success stories as well as lessons learned. For more information about the program, access the website address <http://ops.fhwa.dot.gov/wz/p2p/index.htm>.

Cost: Free

To Access This Resource: Contact the Work Zone Safety and Mobility Peer-to-Peer Program, (866) P2P-FHWA (866-727-3492), fax: (877) 663-2263, workzoneP2P@dot.gov.



Compendium of Work Zone Research, Development, and Technology Transfer

This compendium, available in CD-ROM format, is a database of recent research, development and technology transfer projects pertaining to transportation work zones. The database profiles 332 projects, including such information as the project title, project description, contributing agency, performing agency, year of completion, point of contact, and related reference documents. Users can search the database by keyword, by the different phases of work zone activity (e.g., design, operations, etc.) and by specific subject areas (e.g., worker safety, traffic management, etc.).

Cost: Free

To Access This Resource: To order a copy of the CD-ROM, contact workzonepubs@dot.gov.



Rule on Work Zone Safety and Mobility Implementation Guides and Other Resources

This CD is a compilation of resources to assist agencies with implementation of the 23 Code of Federal Regulations 630 Subpart J, referred to as the “Work Zone Safety and Mobility Rule” or “Final Rule,” which became effective in October 2007. Documents included on the CD include the full text of the Final Rule, brochures and fact sheets, presentations, frequently asked questions (FAQs) with answers, and four implementation guides. The CD also contains interactive tools, such as checklists, flowcharts, templates, and matrices. Local agencies can download these tools from the CD, and then add their own data to create the documentation required or recommended by the Final Rule. The CD concludes with examples from several states—Ohio, New York, North Carolina, North Dakota, Utah, and Washington State—that illustrate the ways agencies can implement the Final Rule. Many sections of the CD require a live Internet connection to link to pages of the Work Zone Mobility and Safety website.

Cost: Free

To Access This Resource: To order a copy of the CD, contact workzonepubs@dot.gov.



QuickZone Version 2.0

QuickZone enables state and local traffic, construction, operations, planning staff, and construction contractors, to estimate traveler delay due to work zones. QuickZone was designed to be easy to learn and use and is suitable for both urban and interurban corridor analysis. QuickZone quantifies corridor delay from capacity decreases in work zones, identifies delay impacts of alternative phasing programs, and supports trade-off analysis between construction costs and delay costs. QuickZone also enables users to consider alternative phasing schedules, to assess the impacts of delay mitigation strategies, and to calculate work completion incentives.

Cost: \$195

To Access This Resource: Order QuickZone through the McTrans Center for Microcomputers in Transportation at the University of Florida, (352) 392-0378, fax: (352) 392-3224, mctrans@ce.ufl.edu, <http://mctrans.ce.ufl.edu>.



Temporary Traffic Control Devices Final Rule: Questions and Answers (2008)

This flier contains questions and answers regarding 23 Code of Federal Regulations (CFR) 630 Subpart K, referred to as the "Temporary Traffic Control Devices Rule." The Temporary Traffic Control Devices Rule was published on December 5, 2007 as a supplement to the Work Zone Safety and Mobility Rule that became effective in October 2007. Topics covered by the flier are based on questions asked during Web-based seminars ("webinars"), presentations, and other outreach efforts to transportation professionals regarding the Temporary Traffic Control Devices Rule. Most recently published in February 2008, this flier is updated as FHWA receives new questions on the Rule.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://ops.fhwa.dot.gov/wz/resources/temptraf_qa.pdf
- HyperText Markup Language (HTML) format: http://ops.fhwa.dot.gov/wz/resources/temptraf_qa.htm



Intelligent Transportation Systems for Work Zones: Deployment Benefits and Lessons Learned (FHWA-JPO-07-003) (2007)

This leaflet is one in a series that show how ITS technologies in support of the U.S. Department of Transportation's Congestion Initiative can reduce congestion. This leaflet summarizes the benefits, costs, extent of deployment, and lessons learned about the use of ITS in work zones. The online version contains a full list of sources, so that all information in the leaflet's brief four pages is backed up with supporting documentation.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS HelpLine, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.its.dot.gov/jpodocs/repts_te/14320_files/14320.pdf
- HyperText Markup Language (HTML) format: http://www.its.dot.gov/jpodocs/repts_te/14320.htm, EDL# 14320



Work Zone Mobility and Safety Fact Sheets (2000-2007)

This series of fact sheets shows activities for improving mobility and safety through construction and maintenance work zones. These fact sheets highlight innovative technologies and best practices; introduce new methods, products, and tools; and share lessons learned from the real-world applications that they examine. The 15 fact sheets cover a wide range of topics, including full road closure, public information and outreach, transportation management plans, performance monitoring, and multi-state collaboration. The fact sheets showcase innovative work zone practices in Arkansas, California, Delaware, Illinois, Missouri, North Carolina, Ohio, Oregon, and Tennessee.

Cost: Free

To Access This Resource: To order hardcopies, contact workzonepubs@dot.gov. For the online versions, access the website address <http://ops.fhwa.dot.gov/wz/practices/factsheets/factsheets.htm>.



Coordinated Freeway and Arterial Operations Handbook (FHWA-HRT-06-095) (2006)

This handbook provides direction, guidance, and recommendations on how to coordinate freeway and arterial operations in a proactive and comprehensive manner. The handbook defines coordinated freeway and arterial (CFA) operations and discusses how to apply CFA to four areas of high

pay-off: traffic incident management, work zone management, planned special events management, and day-to-day (or recurring) operations. The handbook concludes with a discussion of new technologies such as ITS and an example of CFA in an incident management program in Northern Virginia. Development of this handbook was sponsored by the Transportation Management Center Pooled-Fund Study (TMC PFS).

Cost: Free

To Access This Resource: Access the website address

http://tmc pfs.ops.fhwa.dot.gov/cfprojects/uploaded_files/06095.pdf.



Developing and Implementing Transportation Management Plans for Work Zones (FHWA-HOP-05-066) (2006)

This document is designed to help transportation agencies develop and implement Transportation Management Plans (TMPs) for work zones. A TMP lays out a set of work zone management strategies and describes how the strategies will be used to manage the safety and mobility impacts of a road construction or maintenance work zone. The document includes a general approach that can be used to develop TMPs, a list of components that might be included in a TMP, tips for developing effective TMPs, descriptions of work zone management strategies, and examples and best practices from agencies that are currently using TMPs. Developing and implementing TMPs is a key part of compliance with 23 Code of Federal Regulations 630 Subpart J, referred to as the “Work Zone Safety and Mobility Rule,” which was updated in 2004 and became effective October 12, 2007.

Cost: Free

To Access This Resource: To order a hardcopy, contact

workzonepubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://ops.fhwa.dot.gov/wz/resources/publications/trans_mgmt_plans/trans_mgmt_plans.pdf
- HyperText Markup Language (HTML) format: http://ops.fhwa.dot.gov/wz/resources/publications/trans_mgmt_plans/index.htm



Frequently Asked Questions on the Work Zone Safety and Mobility Rule (2006)

This set of frequently asked questions (FAQs) contains questions and answers on a number of popular topics related to 23 Code of Federal Regulations 630 Subpart J, referred to as the “Work Zone Safety and Mobility Rule” that became effective October 12, 2007. Questions and answers were included in this document based on questions received during webcasts and presentations on the Rule and from inquiries the FHWA has received regarding the Rule. This “living” document is being updated continuously as FHWA receives new questions on the Rule.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/wz/resources/final_rule/pdf/rule_faqs.pdf
- HyperText Markup Language (HTML) format: http://www.ops.fhwa.dot.gov/wz/resources/final_rule/rule_faqs.htm



Work Zone Impacts Assessment: An Approach to Assess and Manage Work Zone Safety and Mobility Impacts of Road Projects (FHWA-HOP-05-068) (2006)

This document is designed to help transportation agencies develop and update their own policies, processes, and procedures for assessing and managing the work zone impacts of road construction and maintenance projects. The document includes a general approach for assessing the potential impacts of road projects and can be used as a decision support tool. The approach is organized along the major activities of program delivery: policy, systems planning, preliminary engineering, design, construction, performance assessment, and maintenance and operations. The document provides both generic and real-world examples to help put discussions in context and refers to resources where more information on specific topics can be

obtained. Assessing the impacts of work zones is a key part of compliance with 23 Code of Federal Regulations 630 Subpart J, referred to as the “Work Zone Safety and Mobility Rule,” which was updated in 2004 and became effective October 12, 2007.

Cost: Free

To Access This Resource: To order a hardcopy, contact workzonepubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://ops.fhwa.dot.gov/wz/resources/final_rule/wzi_guide/wzi_guide.pdf
- HyperText Markup Language (HTML) format: http://ops.fhwa.dot.gov/wz/resources/final_rule/wzi_guide/index.htm



Final Rule on Work Zone Safety and Mobility Brochure (FHWA-HOP-05-010) (2005)

This brochure provides an overview of the 23 Code of Federal Regulations 630 Subpart J, referred to as the “Work Zone Safety and Mobility Rule.” The Rule was updated in 2004 and became effective October 12, 2007. The Rule requires all state and local governments that receive Federal-aid highway funding to develop an agency-level work zone safety and mobility policy to support systematic consideration of work zone impacts across all stages of project development. This brochure describes why the rule was updated, the goals of the rule, and its primary components. The Adobe Acrobat version of the brochure also provides a flow diagram illustrating how the rule can be applied to the project delivery process.

Cost: Free

To Access This Resource: To order a hardcopy, contact workzonepubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://ops.fhwa.dot.gov/wz/resources/fr_brochure.pdf
- HyperText Markup Language (HTML) format: http://ops.fhwa.dot.gov/wz/resources/fr_brochure.htm



Final Rule on Work Zone Safety and Mobility Fact Sheets (2005)

This series of four fact sheets provides an overview and explores three key aspects of the 23 Code of Federal Regulations 630 Subpart J, referred to as the “Work Zone Safety and Mobility Rule.” The Rule was updated in 2004 and became effective October 12, 2007. The Rule requires all state and local governments that receive Federal-aid highway funding to develop an agency-level work zone safety and mobility policy to support systematic consideration of work zone impacts across all stages of project development. Overview fact sheet describes why the rule was updated, and how the rule should be applied at the policy, project, and statewide levels. It also lists technical assistance resources available from FHWA. Three other fact sheets explore aspects of the rule regarding work zone impacts assessment, transportation management plans (TMPs), and public information and outreach strategies.

Cost: Free

To Access This Resource: To order a hardcopy, contact workzonepubs@dot.gov. For the online version, access the following website addresses:

- Overview (FHWA-HOP-05-011)—Adobe Acrobat format: http://ops.fhwa.dot.gov/wz/resources/fr_factsheet.pdf
- Overview—HyperText Markup Language (HTML) format: http://ops.fhwa.dot.gov/wz/resources/impact_factsheet.htm
- Work Zone Impacts Assessment (FHWA-HOP-05-023)—Adobe Acrobat format: http://ops.fhwa.dot.gov/wz/resources/impact_factsheet.pdf
- Work Zone Impacts Assessment—HyperText Markup Language format: http://ops.fhwa.dot.gov/wz/resources/impact_factsheet.htm
- Transportation Management Plans for Work Zones (FHWA-HOP-05-022)—Adobe Acrobat format: http://ops.fhwa.dot.gov/wz/resources/tmp_factsheet.pdf
- Transportation Management Plans for Work Zones—HyperText Markup Language format: http://ops.fhwa.dot.gov/wz/resources/tmp_factsheet.htm

- Public Information and Outreach Strategies for Work Zones (FHWA-HOP-05-021)—Adobe Acrobat format:
http://ops.fhwa.dot.gov/wz/resources/outreach_factsheet.pdf
- Public Information and Outreach Strategies for Work Zones —HyperText Markup Language format:
http://ops.fhwa.dot.gov/wz/resources/outreach_factsheet.htm



Implementing the Rule on Work Zone Safety and Mobility (2005) (FHWA-HOP-05-065)

In September 2004, FHWA published updates to the work zone regulations 23 Code of Federal Regulations 630 Subpart J, referred to as the “Work Zone Safety and Mobility Rule.” The Rule requires all state and local governments that receive Federal-aid highway funding to develop an agency-level work zone safety and mobility policy to support systematic consideration of work zone impacts across all stages of project development. The Rule became effective October 12, 2007. This document provides a general overview of the Rule and overarching guidance on how to implement its provisions. This document includes guidelines, sample approaches, examples of transportation agencies that use practices that relate to the Rule, and sources for more information.

Cost: Free

To Access This Resource: To order a hardcopy, contact workzonepubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.ops.fhwa.dot.gov/wz/rule_guide/rule_guide.pdf
- HyperText Markup Language (HTML) format:
http://www.ops.fhwa.dot.gov/wz/rule_guide/index.htm



Work Zone Public Information and Outreach Strategies (FHWA-HOP-05-067) (2005)

This document is designed to help transportation agencies plan and implement effective public information and outreach campaigns to mitigate the negative effects of road construction work zones. Developing and implementing such plans is a key part of compliance with 23 Code of Federal Regulations 630 Subpart J, referred to as the “Work Zone Safety and Mobility Rule,” which was updated in 2004 and became effective October 12, 2007. The document outlines an eight-step process for developing and evaluating these plans. The document also provides examples for each of the eight steps, a checklist of typical actions that are part of developing these plans. The document also presents specific communication strategies and provides example of how these strategies have been used.

Cost: Free

To Access This Resource: To order a hardcopy, contact workzonepubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://ops.fhwa.dot.gov/wz/info_and_outreach/public_outreach_guide.pdf
- HyperText Markup Language (HTML) format: http://ops.fhwa.dot.gov/wz/info_and_outreach/index.htm



Full Closure for Work Zone Operations: Case Studies (2004)

These reports are part of a series designed to educate public sector managers about the applications and benefits of full road closure for work zones, as an alternative to the traditional practice of part-width construction. These case studies examine how transportation authorities in Delaware, Michigan, and Oregon detoured traffic from one or both directions of the roadway for the purpose of performing road work. Each case study describes why a full closure approach was selected, the planning efforts involved, the benefits gained, deployment considerations, and lessons learned.

Cost: Free

To Access This Resource: To order a hardcopy, contact workzonepubs@dot.gov. For the online version, access the following website addresses:

- Reducing the Impact of Construction During the Rehabilitation of a Major Interstate Highway: Interstate 95 in Wilmington, Delaware (FHWA-OP-05-012)—Adobe Acrobat format: http://ops.fhwa.dot.gov/wz/docs/Delaware_v3/full_closure_delawar.pdf
- Reducing the Impact of Construction During the Rehabilitation of a Major Interstate Highway: Interstate 95 in Wilmington, Delaware—HyperText Markup Language (HTML) format: http://ops.fhwa.dot.gov/wz/docs/Delaware_v3/index.htm
- Accelerating Construction and Reducing Crashes During Rehabilitation of a Major Downtown Route: M-10 Lodge Freeway in Detroit, Michigan (FHWA-OP-05-013)—Adobe Acrobat format: http://ops.fhwa.dot.gov/wz/docs/Detroit_v5/full_closure_detroit.pdf
- Accelerating Construction and Reducing Crashes During Rehabilitation of a Major Downtown Route: M-10 Lodge Freeway in Detroit, Michigan—HyperText Markup Language format: http://ops.fhwa.dot.gov/wz/docs/Detroit_v5/index.htm
- Using Weekend Closures to Expedite Road Rehabilitation and Minimize the Impacts on Motorists and Road Builders: I-84 Banfield Freeway in Portland, Oregon (FHWA-OP-05-014)—Adobe Acrobat format: http://ops.fhwa.dot.gov/wz/docs/Portland_v3/full_closure_portlan.pdf
- Using Weekend Closures to Expedite Road Rehabilitation and Minimize the Impacts on Motorists and Road Builders: I-84 Banfield Freeway in Portland, Oregon—HyperText Markup Language format: http://ops.fhwa.dot.gov/wz/docs/Portland_v3/index.htm



Intelligent Transportation Systems in Work Zones: Case Studies (2004)

These four reports are part of a series designed to educate public sector managers about particular ITS technologies. These case studies examine how transportation authorities in Arizona, Illinois, Michigan, and New Mexico used ITS in their work zones to improve mobility and reduce crashes. Each case study describes the work zone, how the ITS system was selected, how it worked, the benefits experienced, and lessons learned.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS HelpLine, (866) 367-7487 or workzonepubs@dot.gov. For the online version, access the following website addresses:

- Work Zone Traffic and Incident Management System (FHWA-OP-04-072)—Adobe Acrobat format: http://www.ops.fhwa.dot.gov/wz/technologies/albuquerque/its_albuquerque.pdf
- Work Zone Traffic and Incident Management System—HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13941.html, EDL# 13941 or <http://www.ops.fhwa.dot.gov/wz/technologies/albuquerque/index.htm>
- Work Zone Travel Time System (FHWA-HOP-04-032)—Adobe Acrobat format: <http://www.ops.fhwa.dot.gov/wz/technologies/arizona/arizona.pdf>
- Work Zone Travel Time System—HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14001.htm, EDL# 14001 or <http://www.ops.fhwa.dot.gov/wz/technologies/arizona/index.htm>
- Dynamic Lane Merge System (FHWA-HOP-04-033)—Adobe Acrobat format: <http://www.ops.fhwa.dot.gov/wz/technologies/michigan/michigan.pdf>
- Dynamic Lane Merge System—HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14011.htm, EDL# 14011 or <http://www.ops.fhwa.dot.gov/wz/technologies/michigan/index.htm>

- Real-Time Work Zone Traffic Control System (FHWA-HOP-04-018)—Adobe Acrobat format: <http://www.ops.fhwa.dot.gov/wz/technologies/springfield/springfield.pdf>
- Real-Time Work Zone Traffic Control System—HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13984.htm, EDL# 13984 or <http://ops.fhwa.dot.gov/wz/technologies/springfield/index.htm>



Full Road Closure for Work Zone Operations: A Cross-Cutting Study (FHWA-OP-04-009) (2003)

These reports are part of a series designed to educate public sector managers about the applications and benefits of full road closure for work zones, as an alternative to the traditional practice of part-width construction. Full road closures involve detouring traffic, from one or both directions of the roadway, for the purpose of performing road work. By examining full road closure projects in Delaware, Kentucky, Michigan, Ohio, Oregon, and Washington, the report discusses why a full closure approach was selected for those projects, what benefits can be expected from using full closure, what factors should be taken into consideration during the planning and operations stages, and what lessons were learned.

Cost: Free

To Access This Resource: To order a hardcopy, contact workzonepubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: <http://ops.fhwa.dot.gov/wz/resources/publications/FullClosure/CrossCutting/FullClosureX-CuttingRpt.pdf>
- HyperText Markup Language (HTML) format: <http://ops.fhwa.dot.gov/wz/resources/publications/FullClosure/CrossCutting/its.htm>



Shorter Duration, Safer Work Zones, More Satisfied Travelers: Successful Applications of Full Road Closure in Work Zones (FHWA-OP-03-086) (2003)

These reports are part of a series designed to educate public sector managers about the applications and benefits of full road closure for work zones, as an alternative to the traditional practice of part-width construction. The brochure highlights full road closure projects in Delaware, Kentucky, Michigan, Oregon, and Ohio, and provides both numerical data and quotes from officials on the benefits these areas experienced.

Cost: Free

To Access This Resource: To order a hardcopy, contact workzonepubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://ops.fhwa.dot.gov/wz/docs/Full%20Closure_BRO-final.pdf
- HyperText Markup Language (HTML) format: <http://ops.fhwa.dot.gov/wz/resources/publications/FullClosure/index.htm>



Intelligent Transportation Systems in Work Zones: A Cross-Cutting Study (FHWA-OP-02-025) (2002)

This report is one in a series designed to educate public sector managers about particular ITS technologies. This report examines how transportation departments in Illinois, Michigan, New Mexico, and Arkansas used ITS in their work zones and recounts the benefits they experienced. The report also profiles other ITS-related work zone products, systems, and techniques.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://ops.fhwa.dot.gov/wz/docs/ITSWorkzones.pdf> or http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13600_files/13600.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13600.html, EDL#14128



Informed Motorists, Fewer Crashes— Using Intelligent Transportation Systems in Work Zones (FHWA-OP-01-043) (2001)

This brochure, one in a series designed to encourage decision-makers to invest their own budget resources in ITS, examines the safety and mobility benefits of the use of ITS in work zones. The brochure quotes elected officials and transportation professionals from around the country about the benefits they have experienced from using ITS in work zones.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13584/13584.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13584.html, EDL# 13584



Maintenance and Construction Operations User Service: An Addendum to the ITS Program Plan (2001)

This document provides a detailed description of the maintenance and construction operations user service. This document serves as an addendum to the *National ITS Program Plan* in describing the 32nd ITS user service, establishes the need for including maintenance and construction operations in the National ITS Architecture, and focuses on four specific functions:

maintenance vehicle fleet management, roadway management, work zone management and safety, and roadway maintenance conditions and work plan dissemination.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_pr/13465.pdf, EDL# 13465.



Phoenix's Roadway Closure and Restriction System: Lessons Learned from the Metropolitan Model Deployment Initiative (FHWA-OP-01-036) (2001)

This is one in a series that documents lessons learned from the Metropolitan Model Deployment Initiative (MMDI). This report documents the benefits of integration between traffic management and traveler information.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13221.pdf, EDL# 13221.



Methods and Practices to Reduce Motorist Delays in European Work Zones (FHWA-PL-00-001) (2000)

This report presents the findings of a scanning tour of several European countries to examine how these countries manage traffic flow through temporary work zones. The European highway agencies were found to adopt a customer-oriented approach toward work zones. The report concludes with several recommendations for improvement of work zone operations in the U.S.

Cost: Free

To Access This Resource: Access the website address <http://www.international.fhwa.dot.gov/Pdfs/workzonebook.pdf>.



Work Zone Operations Best Practices Guidebook: Improving Mobility and Safety on Both Sides of the Barrel (FHWA-JPO-00-010) (2000)

This guidebook documents over 250 best practices for minimizing the impacts of road construction and maintenance on mobility and safety. These best practices were observed during a scanning tour of 26 states and consist of approaches, procedures, and technologies, including advanced technologies such as ITS. The guidebook is available in hardcopy, on CD-ROM, and online as a searchable, interactive database. Readers are invited to contribute new best practices, and the website, hardcopy, and CD-ROM versions of the guidebook all have instructions on how to do so.

Cost: Free

To Access This Resource: To order the hardcopy or CD-ROM, contact workzonepubs@dot.gov. For the online version, access the following website addresses:

- Searchable interactive version: <http://www.ops.fhwa.dot.gov/wz/practices/best/Default.htm>
- Adobe Acrobat version: <http://www.ops.fhwa.dot.gov/wz/practices/best/Documents/workzoneguidebook.pdf>



Meeting the Customer's Needs for Mobility and Safety During Construction and Maintenance Operations (FHWA-HPQ-98-1) (1998)

This report presents the findings of a quality improvement review to assess the effectiveness of FHWA and state departments of transportation policies and procedures for reducing traffic congestion and delays during construction and maintenance operations. The report describes the current state-of-the-practice in work zones (as of 1998), and identifies best practices that can help an agency achieve the state-of-the-art in this area. This report has served as a guiding document for FHWA's Work Zone Mobility and Product Safety Team.

Cost: Free

To Access This Resource: Access the website address
<http://www.fhwa.dot.gov/reports/bestprac.pdf>.

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- Quon Kwan, FMCSA Office of Analysis, Research and Technology, (202) 385-2389, Quon.Kwan@dot.gov
- Julie Lane, FMCSA Office of Analysis, Research and Technology, (202) 385-2391, Julie.Lane@dot.gov



Commercial Vehicle Information Systems and Networks (CVISN) Website

This site is the official website of the Commercial Vehicle Information Systems and Networks (CVISN) program and is a repository of documents pertaining to the program. The site contains documents pertaining to CVISN workshops, the National ITS Architecture, the CVISN architecture and standards, the three CVISN components (safety information exchange, credentials administration, and electronic screening), interoperability testing, expanded CVISN capabilities, and training. The website also contains contact information and related links.

Cost: Free

To Access This Resource: Access the website address <http://cvisn.fmcsa.dot.gov>.



CVISN Collaboration

This website is a compilation of resources relating to the application process for Federal funds under the Commercial Vehicle Information Systems and Networks (CVISN) program. The site includes information about both basic and advanced levels of CVISN deployment. The website contains the *Commercial Vehicle Information Systems and Networks (CVISN) National Program Management Plan*; a brochure listing examples of acceptable and unacceptable sources of matching funds; frequently asked questions; a calendar of upcoming training, meetings, and conferences, and other events; discussion boards; and the Grants.

gov newsletter. The purpose of the website is to assist CVISN program partners, such as state governments, in applying for CVISN funds and enhancing CVISN in their own states.

Cost: Free

To Access This Resource: Access to the website is restricted to CVISN program partners. To apply for a username and password, contact Nancy Magnusson of the Johns Hopkins University Applied Physics Laboratory, (443) 778-7033, Nancy.Magnusson@jhuapl.edu. CVISN program partners access the site through the address <https://partners.jhuapl.edu/ba/hp/cvisn>.



Commercial Vehicle Information Systems and Networks (CVISN) National Program Management Plan (2007)

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), passed in 2005, authorized \$2.5 million to each state to implement core capabilities of the Commercial Vehicle Information Systems and Networks (CVISN) program. SAFETEA-LU also authorized up to an additional \$1 million per state to implement expanded CVISN capabilities. Furthermore, states that are certified as Core CVISN Compliant and have received less than \$2.5 million can use the remainder of these funds to deploy additional core CVISN capabilities or expanded CVISN capabilities. This document describes how FMCSA will manage this grant program. The document provides definitions of “core” and “expanded” CVISN capabilities and discusses the process that was used to develop these definitions, which relied heavily on stakeholder input. The document presents the formulas that FMCSA will use to calculate states’ eligibility for these Federal grants and requirements for state matching funds. The document describes the process FMCSA will use to distribute the grants and the process by which FMCSA will ensure states’ compliance with the CVISN program and its architecture. The document concludes with FMCSA’s communication and training plan for this grant program, as well as a summary of the roles and responsibilities of FMCSA and its public and private sector partners.

Cost: Free

To Access This Resource: Contact Julie Lane, FMCSA Office of Analysis, Research and Technology, (202) 366-2391, Julie.Lane@dot.gov.



Electronic Toll Collection/Electronic Screening Interoperability Pilot Project Final Report Synthesis (2005)

This report documents the findings of a pilot test of regional interoperability between electronic toll collection (ETC) and commercial vehicle electronic screening (E-Screening). Tests of key integration technologies, developed in the earlier stages of the project, took place in Connecticut, Maryland, and New York State in 2004. The test also found that the integration of ETC and E-Screening does not result in quantifiable mobility and efficiency benefits to the motor carrier industry, but does result in significant environmental benefits through reduced truck idling and emissions.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14256_files/14256.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14256.htm, EDL# 14256



Expanded Commercial Vehicle Information Systems and Networks (CVISN) (2005)

This series of reports documents the progress of the Expanded Commercial Vehicle Information Systems and Networks (Expanded CVISN) Initiative through June 2005. Expanded CVISN builds on core CVISN capabilities to continue to enhance the safety, security, and productivity of commercial vehicle operations. In 2004, FMCSA engaged stakeholders to identify the capabilities necessary to achieve the goals of Expanded CVISN. To this end, FMCSA established program area working groups—Driver Information Sharing, Enhanced Safety Information Sharing, Smart Roadside, and Expanded E-Credentialing—and eight high-priority capabilities needed for Expanded CVISN. The findings of the work groups for each of the high-priority capabilities are presented in a separate report that include detailed capability descriptions, proposed technical solutions, potential costs and

benefits, and proposed deployment strategies. A summary report highlights common themes that emerged within the working groups and outlines steps that must be taken to provide direct support for the Expanded CVISN Initiative.

Cost: Free

To Access This Resource: Access the following website addresses:

- Summary Report: http://cvisn.fmcsa.dot.gov/downdocs/cvisndocs/reports/Expanded_CVISN_Summary_Report_draft.pdf
- Driver Snapshots: http://cvisn.fmcsa.dot.gov/downdocs/cvisndocs/reports/Driver_Snapshots_v1_report.pdf
- Safety Data Quality: http://cvisn.fmcsa.dot.gov/downdocs/cvisndocs/reports/Safety_%20Data_Quality_v1_report.pdf
- Roadside Access to Data: http://cvisn.fmcsa.dot.gov/downdocs/cvisndocs/reports/Roadside_Access_to_Data_v1_report.pdf
- Access to Credentials Data: http://cvisn.fmcsa.dot.gov/downdocs/cvisndocs/reports/Access_to_Credentials_Data_v1_report.pdf
- Access to Driver Data: http://cvisn.fmcsa.dot.gov/downdocs/cvisndocs/reports/Access_to_Driver_Data_v1_report.pdf
- Carrier Access to Safety Data: http://cvisn.fmcsa.dot.gov/downdocs/cvisndocs/reports/Carrier_Access_to_Safety_Data_v1_report.pdf
- Virtual Roadside Sites: http://cvisn.fmcsa.dot.gov/downdocs/cvisndocs/reports/Virtual_Roadside_Sites_v1_report.pdf
- Better E-Credentialing: http://cvisn.fmcsa.dot.gov/downdocs/cvisndocs/reports/Better_E-Credentialing_v1_report.pdf



CVISN for Commercial Vehicles (2004)

These two reports are part of a series designed to educate public and private sector managers about particular ITS technologies. These case studies provide an in-depth view of the deployment of Commercial Vehicle Information Systems and Networks (CVISN) electronic credentialing and safety information exchange in Washington State and Connecticut. These studies describe benefits, successful practices, and lessons learned in operations and management from the point of view of early CVISN-adopting states.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS Helpline, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following e-mail addresses:

- CVISN Electronic Credentialing for Commercial Vehicles in Washington State: A Case Study (FHWA-JPO-04-029/FMCSA-RT-04-001)—Adobe Acrobat format:
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13980_files/washington.pdf
- CVISN Electronic Credentialing for Commercial Vehicles in Washington State: A Case Study—HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13980.htm, EDL# 13980
- CVISN Safety Information Exchange for Commercial Vehicles in Connecticut: A Case Study (FHWA-JPO-04-030/FMCSA-RT-04-002)—Adobe Acrobat format:
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13981_files/Connecticut.pdf
- CVISN Safety Information Exchange for Commercial Vehicles in Connecticut: A Case Study—HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13981.htm, EDL# 13981



CVISN: Partnerships for Safer, Simpler and Smarter Transportation Systems (2004)

This brochure provides a brief overview of the Commercial Vehicle Information Systems and Networks (CVISN) program and emphasizes that partnerships among the Federal government, state governments, and the private sector are key to CVISN's success. The brochure describes the CVISN program and its goals, outlines a three-step process for CVISN development, and lists expected benefits. The brochure also discusses how CVISN can enhance the security of interstate motor carrier transportation.

Cost: Free

To Access This Resource: Contact Jeff Secrist, FMCSA Office of Analysis, Research and Technology, (202) 385-2367, Jeff.Secrist@dot.gov.



CVISN Guide Series (2000-2002)

This series of eight documents provides a broad overview of the Commercial Vehicle Information Systems and Networks (CVISN) effort, as well as lessons learned from previous CVISN deployments. The eight documents are classified into three types. Management guides (an introductory guide and guides on program and project planning and phase planning and tracking) describe how to apply proven project management methods to organize and execute a state CVISN deployment project. Technical process guides (on top-level design and integration and testing) describe how to apply system engineering methods to the problem of designing, testing, and integrating CVISN Level 1 capabilities in a state. Technical application guides (on safety information exchange, credentials administration, and electronic screening) address how to apply the National ITS Architecture and the experience gained from previous CVISN deployments to a particular CVISN Level 1 application area. The latest versions of all guides are available at <http://cvisn.fmcsa.dot.gov/default.aspx?PageID=guides>.

Cost: Free

To Access This Resource: Access the following website addresses:

- Introductory Guide to CVISN (2000):
http://cvisn.fmcsa.dot.gov/downdocs/cvisndocs/guides/intro_p2/pdf_all1/intro_p2full.pdf
- CVISN Guide to Program and Project Planning (2001):
http://cvisn.fmcsa.dot.gov/downdocs/cvisndocs/guides/plan_v1/pdf_all1/planning_v1.pdf
- CVISN Guide to Phase Planning and Tracking (2001):
http://cvisn.fmcsa.dot.gov/downdocs/cvisndocs/guides/pptrk_v1/pdf_all1/tracking_v1.pdf
- CVISN Guide to Top-Level Design (2001):
http://cvisn.fmcsa.dot.gov/downdocs/cvisndocs/guides/toplvl_v1/pdf_all1/tl_v1pdf.pdf
- CVISN Guide to Integration and Test (2001):
http://cvisn.fmcsa.dot.gov/downdocs/cvisndocs/guides/intstguide_d1/intestd1full.pdf
- CVISN Guide to Safety Information Exchange (2002):
http://cvisn.fmcsa.dot.gov/downdocs/cvisndocs/guides/safety_v1/pdf_all1/v1_safetyexg.pdf

- CVISN Guide to Credentials Administration (2000):
http://cvisn.fmcsa.dot.gov/downdocs/cvisndocs/guides/cred_p2/pdf_all1/ca_p2pdf.pdf
- CVISN Guide to Electronic Screening (2002):
http://cvisn.fmcsa.dot.gov/downdocs/cvisndocs/guides/escrn_v1/pdf_all1/es_v1pdf.pdf



Evaluation of the Commercial Vehicle Information Systems and Networks (CVISN) Model Deployment Initiative (2002)

Commercial Vehicle Information Systems and Networks (CVISN) is a collection of information systems and communication networks used by government agencies, motor carriers, and other stakeholders involved in commercial vehicle operations (CVO). A CVISN Model Deployment Initiative was launched in 1996 to demonstrate the technical and institutional feasibility of CVISN, as well as determining its costs and benefits, thus encouraging further deployment. The initial participants included two prototype states—Maryland and Virginia—and eight pilot states—California, Colorado, Connecticut, Kentucky, Michigan, Minnesota, Oregon, and Washington. This report documents the findings of the evaluation in terms of increased highway safety, streamlined government credentialing operations, and increased productivity and reduced delays for motor carriers.

Cost: Free

To Access This Resource: Access the following website addresses:

- Volume 1: Final Report—Adobe Acrobat format:
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13677/13677.pdf
- Volume 1: Final Report—HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13677.html, EDL# 13677
- Volume 2: Appendices: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13699.pdf, EDL# 13699



What Have We Learned about Intelligent Transportation Systems? Chapter 6: What Have We Learned about ITS for Commercial Vehicle Operations? Status, Challenges, and Benefits of CVISN Level 1 Deployment (2000)

This document is an excerpt from a compendium report that looks back on the 10 years of the National ITS Program to examine which ITS technology applications have been successful, which have not been successful, and what the underlying factors that determine success versus failure are. This section examines commercial vehicle operations (CVO) technologies for safety information exchange, electronic screening, and electronic credentialing.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13322.pdf, EDL# 13322.



Introduction to ITS/CVO and CVISN (CVISN 101)

This Web-based course provides an introduction to the ITS/CVO program and the Commercial Vehicle Information Systems and Networks (CVISN) initiative. The course includes a short discussion of some of the problems currently existing in CVO, and an overview of the four main areas of the ITS/CVO program: Safety Assurance, Credentials Administration, Electronic Screening, and Carrier Operations. The concepts underlying current and future strategies are described for each of these areas, as well as the technologies used to carry them out. The discussion of CVISN focuses on the Level 1 capabilities (Safety Information Exchange, Electronic Credentialing and Electronic Screening) and the deployment process developed for their implementation.

Target Audience: Public sector transportation professionals including Federal engineers, planners, project managers, and field staff and others as appropriate. Transportation professionals from state, regional, and local agencies would also benefit from participation in the course. A blended Web-based version provides online interaction between participants and instructors. **Course Length:** Six hours.

Cost: \$150 per participant for the Web-based version; \$175 per participant for the blended version.

To Access This Resource:

- Access the website address <http://www.citeconsortium.org/courses/2mod3.html>.
- Contact Julie Lane, FMCSA Office of Analysis, Research and Technology, (202) 385-2391, Julie.Lane@dot.gov or Carolyn Temperine, FMCSA Eastern Service Center, (518) 431-4239 x270, Carolyn.Temperine@dot.gov.



Advanced CVISN (CVISN 102)

This comprehensive course builds on the knowledge gained in CVISN 101 by delving into the specifics of the Commercial Vehicle Information Systems and Networks (CVISN) initiative. In this course, students will explore effective outreach strategies for securing ongoing support and buy-in to CVISN and learn how to meet funding challenges throughout the CVISN life cycle. Students will investigate CVISN's primary objective—to develop and deploy information systems that support capabilities in Safety Information Exchange, Credentials Administration, and Electronic Screening. In addition, the course presents a variety of best practices related to CVISN issues in states. Target Audience: Public sector transportation professionals including Federal engineers, planners, project managers, and field staff and others as appropriate. Transportation professionals from state, regional, and local agencies would also benefit from participation in the course. A blended Web-based version provides online interaction between participants and instructors. Course Length: 8 to 10 hours.

Cost: \$175 per participant for the Web-based version; \$250 per participant for the blended version.

To Access This Resource:

- Access the website address <http://www.citeconsortium.org/courses/CVISN102.html>.
- Contact Julie Lane, FMCSA Office of Analysis, Research and Technology, (202) 385-2391, Julie.Lane@dot.gov or Carolyn Temperine, FMCSA Eastern Service Center, (518) 431-4239 x270, Carolyn.Temperine@dot.gov.



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- David Smith, FHWA Office of Safety, (202) 366-6614, David.Smith@dot.gov
- Charlene Wilder, FTA Service Innovation Division, (202) 366-1077, Charlene.Wilder@dot.gov
- Earl Hardy, NHTSA Traffic Law Enforcement Division, (202) 366-4292, Earl.Hardy@dot.gov
- Laurie Flaherty, NHTSA Office of Emergency Medical Services, (202) 366-2705, Laurie.Flaherty@dot.gov

<http://>

ITS Public Safety Program Section of the ITS Joint Program Office Website

This website is a compilation of resources related to the ITS Public Safety Program. The site lists the mission, focus areas, and project benefits of the program, an explanation of how the program is administered, and contact information for program staff. The website profiles each of the ITS Public Safety Program's projects, including the Intelligent Transportation Society of America's (ITS America) Public Safety Advisory Group (PSAG), the Wireless Enhanced 9-1-1 (Wireless E9-1-1) Initiative, and the Integrated Incident Management System (IIMS). The website contains several key documents available for downloading, including papers, journal articles, and project final reports such as *Recommendations for ITS Technology in Emergency Medical Services*, and *Model Procedures Guide for Highway Incidents*.

Cost: Free

To Access This Resource: Access the website address <http://www.its.dot.gov/pubsafety/index.htm>.

http://

Emergency Transportation Operations Section of the FHWA Office of Operations Website

This site is a compilation of resources related to maintaining the security of transportation operations during natural and manmade disasters, defining a new concept called “emergency transportation operations preparedness.” The site outlines the FHWA Office of Operations perspective, vision, and role, as well as lists components and activities of the program. The site provides guidance materials on obtaining Federal funding for transportation security operations. The site also contains a comprehensive list of introductory materials on this topic with special emphasis on the protection of electronic infrastructure, as well as contacts and related links.

Cost: Free

To Access This Resource: Access the website address

<http://www.ops.fhwa.dot.gov/OpsSecurity/index.htm>.

http://

Capital Wireless Integrated Network (CapWIN) Website

This website is a compilation of resources related to the Capital Wireless Integrated Network (CapWIN) project—a partnership in the Washington, D.C., area to develop a wireless information network that integrates criminal justice and transportation management functions. The site contains a description of the project, recent news, project sponsors, goals and objectives (including notes on whether or not the objectives have been met and when they were met), roles of the various project participants, a task list, and a timetable showing milestones reached. The site also contains an archive of key project documents, including two documents developed under the sponsorship of the International Association of Chiefs of Police (IACP) describing best practices for integrated public safety and transportation management.

Cost: Free

To Access This Resource: Access the website address

<http://www.capwin.org>.



Traffic Signal Preemption for Emergency Vehicles: A Cross-Cutting Study (FHWA-JPO-05-010) (2006)

This report is one in a series designed to educate public sector managers about particular ITS technologies. Emergency vehicle preemption (EVP) systems give emergency response vehicles a green light on their approach to a signalized intersection while providing a red light to conflicting approaches. This report examines how transportation, police, fire/rescue and emergency medical services (EMS) officials in three local jurisdictions—Fairfax County, Virginia; Plano, Texas; and St. Paul, Minnesota—used EVP to improve emergency vehicle response time, improve safety, and lower costs. The report discusses who is using EVP nationwide and what the technology options, as well as benefits, costs, and lessons learned are from their implementation.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS HelpLine, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14097_files/14097.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14097.htm, EDL# 14097



Recommendations for ITS Technology in Emergency Medical Services (2002)

This document was developed by the Public Safety Advisory Group of the Intelligent Transportation Society of America (ITS America) as formal advice to the U.S. DOT on the role of ITS technologies in emergency medical services. New telecommunications and in-vehicle safety devices have entered the market without sufficient input from emergency medical services (EMS) professionals. These new technologies—such as cellular telephones, emergency assistance systems (Mayday systems), and automatic collision notification systems—pose significant challenges to EMS personnel. A secondary purpose of the document is to open a dialogue about the role of ITS technology in emergency medical services among the EMS

community, private sector equipment manufacturers, and public sector transportation agencies, in order to address the challenges posed by these technological advances.

Cost: Free

To Access This Resource: Access the following website addresses:

- Summary: <http://www.its.dot.gov/pubsafety/docs/EMSTechBrief.pdf>
- Full Report—Adobe Acrobat format: http://www.its.dot.gov/pubsafety/docs/recommendations_itsems.pdf
- Full Report—HyperText Markup Language (HTML) format: http://www.its.dot.gov/pubsafety/EMS_recommendations_ITS.htm



The New York State Wireless Enhanced 9-1-1 Project Reports (2002)

This pair of reports focuses on the implementation of a wireless enhanced 9-1-1 project initiated in New York State in 1999 and funded jointly by NHTSA and the ITS Joint Program Office. The most daunting challenge faced by the project participants in New York State is the same one faced by Public Safety Answering Points (PSAPs) nationwide. The rapid proliferation of wireless telephones has resulted in a steady erosion of the ability to locate 9-1-1 callers, because wireless telephones do not currently provide emergency dispatchers with automated caller location or identification information. Barriers to enhanced 9-1-1 implementation in New York State included call routing, lack of funding for necessary equipment upgrades, and the “closest car” concept. Project participants employed several strategies to overcome these barriers, the most important being the introduction of the medial leadership model and the focus on the patient that this model provided. A lessons learned report documents the lessons learned from the project. An implementation guide builds on the lessons learned from the project in New York State to provide more generalized advice for other regions wishing to improve their own enhanced 9-1-1 services.

Cost: Free

To Access This Resource: Access the following website addresses:

- Implementation Guide—Adobe Acrobat format:
<http://www.its.dot.gov/pubsafety/docs/implementationguide.pdf>
- Implementation Guide—HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13973.html, EDL# 13973 or http://www.its.dot.gov/pubsafety/injury_control_center.htm
- Lessons Learned—Adobe Acrobat format:
<http://www.its.dot.gov/pubsafety/docs/lessons.pdf>
- Lessons Learned—HyperText Markup Language format:
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13972.html, EDL# 13972 or http://www.its.dot.gov/pubsafety/new_york_state_wireless_enhanced_lessons_learned.htm



What Have We Learned about Intelligent Transportation Systems? Chapter 2: What Have We Learned about Freeway, Incident, and Emergency Management and Electronic Toll Collection? (2000)

This document is an excerpt from a compendium report that looks back on the 10 years of the National ITS Program to examine which ITS technology applications have been successful, which have not been successful, and what the underlying factors are that determine success versus failure. This section examines freeway, incident, and emergency management and electronic toll collection systems.

Cost: Free

To Access This Resource: Access the website address

http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13318.pdf, EDL# 13318.



Enhancing Public Safety, Saving Lives— Emergency Vehicle Preemption (FHWA-JPO-99-002) (1999)

This brochure, one in a series designed to encourage decision-makers to invest their own budget resources in ITS, examines the public safety benefits of preemption of traffic signals for emergency vehicles such as fire trucks. The brochure quotes chiefs of transportation and fire departments at several cities around the country about the benefits they have experienced from using these systems.

Cost: Free

To Access This Resource: Access the website address <http://www.itsdocs.fhwa.dot.gov/jpodocs/brochure/6871.pdf>.



Faster Response Time, Effective Use of Resources—Integrating Transportation and Emergency Management Systems (FHWA-JPO-99-004) (1999)

This brochure, one in a series designed to encourage decision-makers to invest their own budget resources in ITS, examines the safety and efficiency benefits of integrating traffic incident management (typically led by transportation departments) with emergency response (typically run by law enforcement). The brochure quotes leaders in transportation and law enforcement about the benefits they have experienced from co-locating critical functions, sharing communications media, and automating notification to responding agencies.

Cost: Free

To Access This Resource: Access the website address <http://www.itsdocs.fhwa.dot.gov/jpodocs/brochure/6874.pdf>.



Speeding Response, Saving Lives— Automatic Vehicle Location Capabilities for Emergency Vehicles (FHWA-JPO-99-003) (1999)

This brochure, one in a series designed to encourage decision-makers to invest their own budget resources in ITS, examines the public safety benefits of installing automatic vehicle location (AVL) technology on emergency vehicle fleets, such as ambulances, fire trucks, and police vehicles. The brochure quotes chiefs of transportation, law enforcement, fire, and disaster recovery at cities, states, and private organizations around the country about the benefits they have experienced from using these systems.

Cost: Free

To Access This Resource: Access the website address
<http://www.itsdocs.fhwa.dot.gov/jpodocs/brochure/6866.pdf>.



Intelligent Transportation Systems Field Operational Test Cross-Cutting Study: Emergency Notification and Response (FHWA-JPO-99-033) (1998)

This report summarizes and interprets the results of two field operational tests (FOTs) that tested the use of new technologies for emergency notification and response. Topics covered include impacts, user response, technical lessons learned, institutional challenges and resolutions, and implementation costs.

Cost: Free

To Access This Resource: Access the website address
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/6326.pdf.



Highway Safety for Emergency Services (2002)

This video provides training for “first responders” to a crash scene—police, fire, and emergency medical services (EMS) personnel—on how to use ITS technologies to improve safety for nearby motorists as well as to protect themselves and their equipment. Produced by the Cumberland Valley Volunteer

Fireman's Association (CVVFA) with a grant from the U.S. Fire Administration (USFA), the video highlights the fact that, at present, first responders have little, if any, say in the transportation management strategies employed at the scenes of incidents to which they are responding. One of the purposes of the video is to open a dialogue between first responders and transportation management agencies on this important topic. In addition, the video presents tips for first responders on how to improve safety: from how to park police cars, to whether first responders should direct traffic, to what color clothing they should wear.

Cost: Free

To Access This Resource: To order a copy of the video, contact Steve Austin, Cumberland Valley Volunteer Fireman's Association, (302) 995-0303, SteveAustin@earthlink.net.



Highway-Rail Intersections Points-of-Contact

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- Steven Mortensen, FTA Office of Mobility Innovation, (202) 493-0459, Steven.Mortensen@dot.gov
- Terrell Williams, FTA Office of Mobility Innovation, (202) 366-0232, Terrell.Williams@dot.gov
- Anya Carroll, Volpe National Transportation Systems Center, (617) 494-3122, Anya.A.Carroll@volpe.dot.gov

<http://>

FRA's Intelligent Grade Crossing Website

This website gives the FRA's view of the potential applications of ITS at highway-rail intersections (HRIs) and briefly outlines FRA's past accomplishments, current activities, and future plans in this area. Accomplishments include the development of standards for the use of ITS-generated archived data. Current activities include development of standards for the use of ITS at highway-rail intersections and pilot deployments of Positive Train Control (PTC) technology in Michigan, Illinois, and Alaska. Future plans include field tests of prototype ITS equipment that is integrated with PTC, once the pilot deployments of PTC have been completed.

Cost: Free

To Access This Resource: Access the website addresses

<http://www.fra.dot.gov/us/content/247> or
<http://www.fra.dot.gov/us/content/1270>.



Railroad-Highway Grade Crossing Handbook—Revised Second Edition (FHWA-SA-07-010) (2007)

This handbook serves as a basic reference for common practices, best practices, and adopted standards related to highway-rail grade crossings. The handbook discusses the various components of highway-rail grade crossings, including highway components,

railroad components, tracks and signaling. The handbook shows how to assess the safety and operation of a crossing and discusses numerous options for crossing improvements, including passive and active traffic control devices, grade separation, and even crossing elimination. The handbook presents several methods that can be used to select among multiple crossing improvement options and provides advice on the implementation of these options. An extensive set of appendices contains example forms, policies, and other materials developed at the state level. Last updated in 1996, the 2007 edition includes a compendium of materials included in the previous handbook that have been supplemented with new information and regulations available at the time of the update. Updates were drawn from current versions of relevant legislation, policy memoranda, *Federal Register* notices, and regulatory actions.

Cost: Free

To Access This Resource: Access the website address <http://safety.fhwa.dot.gov/xings/07010/index.htm>.



FRA's Five-Year Strategic Plan for Railroad Research, Development, and Demonstrations (2002)

This document outlines a vision for the future of railroads and the emerging technologies needed to support this vision. The document presents the research, development and demonstration projects that the FRA will pursue in the next five years. The projects are divided into three main areas: railroad research and development, next-generation high-speed rail technology demonstrations, and magnetic levitation technology deployment. The document also presents the statistics-based risk analysis process used by the FRA to prioritize the projects selected, as well as FRA's available and projected funding that will support these projects. Intelligent Railroad Systems, which include ITS technologies used to improve safety and mobility at railroad grade crossings, are also described in the document. The document contains Executive Summary, Introduction, and Conclusion sections that note trends in rail technology as well as rail transportation overall.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://www.fra.dot.gov/downloads/Research/rdv0202.pdf>
- HyperText Markup Language (HTML) format: <http://www.fra.dot.gov/us/content/225>



Advanced Warning for Railroad Delays in San Antonio: Lessons Learned from the Metropolitan Model Deployment Initiative (FHWA-OP-01-038) (2001)

This is one in a series that documents lessons learned from the Metropolitan Model Deployment Initiative (MMDI). This report documents the benefits of integration of traveler information and highway-rail intersections.

Cost: Free

To Access This Resource: Access the website address

http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13284.pdf.



Intelligent Transportation Systems at Highway-Rail Intersections: A Cross-Cutting Study (FHWA-JPO-01-149) (2001)

This report examines the commonalities and differences among seven projects that use ITS to improve safety and mobility at highway-rail grade crossings. For each project, the report lists what functions were tested, who were the partners involved, where the test was conducted, what was the evaluation methodology used, and what were the test results. This report also lists project costs and sources of funding, if available.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13587/13587.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13587.html, EDL# 13587



ITS Technology at Highway-Rail Intersections: “Putting It to the Test” (2000)

This document serves as proceedings to the ITS Joint Program Office Highway-Rail Intersection Evaluation Workshop, held May 6-7, 1999 in Cambridge, Massachusetts. These proceedings contain summaries of the current deployment status and evaluation findings from seven projects in the U.S. that use ITS technology at highway-rail intersections (HRIs). The proceedings also summarize panel discussions of implementation issues, passive grade crossings, standards, and the Federal role in HRI-ITS deployment.

Cost: Free

To Access This Resource: Access the website address <http://www.itsdocs.fhwa.dot.gov/jpodocs/proceedn/12363.pdf>, EDL# 12363.



Safety at Passive Grade Crossings (1998)

Passive highway-rail grade crossings (those without electronic traffic control devices, such as bells, gates, and lights) present a daunting safety challenge. The crash rate per vehicle miles traveled is higher at passive than at active crossings, and crashes at passive crossings are more likely to be fatal. However, the cost of eliminating a crossing or upgrading it from passive to active is very high. In this report, the National Transportation Safety Board (NTSB) explores several alternatives to crossing elimination and upgrade that could improve safety at passive crossings. Volume 1 discusses problems drivers encounter at passive crossings, then presents the NTSB’s analysis, conclusions, and recommendations. Volume 2 contains case summaries of the 60 crashes investigated by the NTSB for this study.

Cost: Free

To Access This Resource: Access the following website addresses:

- Volume 1: Analysis: <http://www.nts.gov/Publicctn/1998/SS9802.pdf>
- Volume 2: Case Summaries: <http://www.nts.gov/Publicctn/1998/SS9803.pdf>



Highway-Rail Intersection User Service (1996)

This document provides a detailed description of the highway-rail intersection ITS user service. This document serves as an addendum to the *National ITS Program Plan* in describing the 30th ITS user service and establishes the need for including highway-rail grade crossing safety in the National ITS Architecture.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_pr/12503.pdf, EDL# 12503. This document is also included as an appendix in the *National Intelligent Transportation Systems Program Plan: Five-Year Horizon*.



Railroad-Highway Grade Crossing Improvement Program (NHI# 380005)

This course presents a broad overview of various options for improving highway-rail intersections, also called railroad grade crossings. The course covers historical background, definition of grade crossing components, collection and maintenance of data, assessment of crossing safety and operations, identification and selection of improvement alternatives, program and project development and implementation, maintenance, private crossings, and the Operation Lifesaver program. The workshop format enables participants to apply the material in a series of exercises. Target Audience: Representatives of Federal, state, and local transportation agencies responsible for the design, construction and maintenance of highway-rail intersections. Also, state and local traffic engineers responsible for highway-railroad grade crossing safety. Course Length: Two days.

Cost: \$300 per participant

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "380005."



Intelligent Safety Systems Points-of-Contact

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- Amy Houser, FMCSA Office of Analysis, Research and Technology, (202) 385-2382, Amy.Houser@dot.gov

http://

Integrated Vehicle-Based Safety Systems Website

The Integrated Vehicle-Based Safety Systems (IVBSS) Initiative aims to accelerate deployment of advanced driver safety systems in new light vehicles and heavy commercial trucks. These safety systems will help drivers avoid the most common types of fatal collisions: rear-end, lane-change, and roadway departure. In this initiative, the U.S. DOT is partnering with members of the automotive and heavy truck industries to develop and field test the next generation of advanced safety systems. This website presents program goals, background, approach, milestones, and points-of-contact, as well as announcements of upcoming events and availability of reports.

Cost: Free

To Access This Resource: Access the website address

<http://www.its.dot.gov/ivbss/index.htm>.

http://

Intersections/Red Light Enforcement Camera Resources Section of the FHWA Office of Safety Website

This website is a compilation of resources related to red light camera (RLC) enforcement systems. The site contains an overview of RLC systems, a discussion of camera technology, and an annotated bibliography of important references, guidance documents, and technical reports. The site also contains points-of-contact and related links. Case studies from California, Maryland, Minnesota, New York, and Virginia show the safety benefits these local jurisdictions have experienced after deploying red light camera systems.

Cost: Free

To Access This Resource: Access the website address

http://safety.fhwa.dot.gov/intersections/redl_cameras.htm.

http://

NHTSA's Intelligent Transportation Systems Website

This website profiles the National Highway Traffic Safety Administration's ITS activities. The site contains detailed profiles of NHTSA projects in the areas of collision avoidance, vision enhancement systems, heavy vehicle stability, automatic collision notification, and cross-cutting activities. The site also contains a description of NHTSA's ITS program, selected technical publications, and related links.

Cost: Free

To Access This Resource: Access the website address <http://www-nrd.nhtsa.dot.gov/departments/nrd-12/IntelligentTransportationSystems.html>.

http://

NHTSA Office of Crash Avoidance Research Technical Publications Website

This website contains a bibliography of all technical publications issued by the NHTSA Office of Crash Avoidance Research from 1989 to the present. The more recent publications can be downloaded directly from the site.

Cost: Free

To Access This Resource: Access the website address http://www-nrd.nhtsa.dot.gov/departments/nrd-12/pubs_rev.html.

http://

Vehicle Research and Test Center's Crash Avoidance Research/ITS Research Website

This website describes the array of research projects that use ITS technologies for crash avoidance that are being conducted at the NHTSA's Vehicle Research and Test Center (VRTC) in East Liberty, Ohio. The website contains detailed descriptions of what is being tested in current research projects and what has been learned in completed projects.

Cost: Free

To Access This Resource: Access the website address

<http://www.nhtsa.dot.gov/portal/site/nhtsa/menuitem.081e92a06f83bfd24ec86e10dba046a0>.



Automated Enforcement: A Compendium of Worldwide Evaluation Results (DOT-HS-810-763) (2007)

This report documents the results of an international literature review of evaluations of two types of automated enforcement systems: automated speed enforcement (ASE) and red light running enforcement (also known as “red light cameras” or “RLC”). This report not only compiled evaluation findings from studies identified through a literature search but also analyzed the studies for methodological rigor, i.e., how well these studies could attribute safety gains to automated enforcement program implementation and exclude confounding factors. The review found that studies evaluating automated speed enforcement reported significant reductions in estimated crashes following program implementation, but only a few of these studies were well controlled. The review also found that studies evaluating red light cameras support the assertion that RLCs can reduce crash severity at high priority intersections. The review concludes with recommendations for future evaluations.

Cost: Free

To Access This Resource: Access the website address

<http://www.nhtsa.dot.gov/staticfiles/DOT/NHTSA/Traffic%20Injury%20Control/Articles/Associated%20Files/HS810763.pdf>.



Saving Lives Through Advanced Vehicle Safety Technology: Intelligent Vehicle Initiative Final Report (FHWA-JPO-05-057) (2005)

This report provides an overview of the Intelligent Vehicle Initiative throughout its eight-year history. The report lists the initiative’s goals, examines how well these goals have been reached, and discusses future directions for additional research. The report concludes with a detailed bibliography of reference sources.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_pr/14153_files/ivi.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_pr/14153.htm, EDL# 14153



Red Light Camera Systems Operational Guidelines (2005)

The purpose of these guidelines is to assist state and local jurisdictions that are considering the implementation of red light camera (RLC) enforcement systems. The guidelines cover problem identification, consideration of various safety countermeasures, RLC program initiation, system planning, engineering design, installation, operation, maintenance, and public information and education. Appendices provide an extensive list of references and a discussion of legal considerations.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://safety.fhwa.dot.gov/intersections/rlc_guide/rlcguide05jan.pdf
- HyperText Markup Language (HTML) format: http://safety.fhwa.dot.gov/intersections/rlc_guide/index.htm



Final Report: Evaluation of the Freightliner Intelligent Vehicle Initiative Field Operational Test (2003)

This report presents the findings of an operational test of two functions of a new Roll Advisor and Control (RA&C) system: Roll Stability Advisor (RSA) and Roll Stability Control (RSC). The private company Freightliner, in partnership with the fleet operator Praxair and the University of Michigan Transportation Research Institute (UMTRI), tested the RA&C system, which is designed to assist commercial vehicle drivers, especially drivers of

tanker trucks, avoid rollover crashes. The test concluded that the RA&C system could prevent up to 20 percent of rollover crashes caused by drivers using excessive speed on sharp curves.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13871.html, EDL# 13871.



Improving Highway Safety with Intelligent Transportation Systems (ITS) (NHI Course# 137044)

The goal of this course is to increase awareness of the highway safety benefits offered by ITS technologies. Highway safety benefits may be experienced at the highway system, mainstream (highway improvement project) and stand-alone project level. The course surveys the participants on their experiences deploying ITS for highway safety improvements and reviews procedures and requirements of safety strategic planning and the ITS deployment process. Ideally, participants will comprise a 50/50 split between safety and ITS personnel so that experiences, expectations, and contributions will be shared. This course is available in classroom and Web-based versions. Target Audience: Both ITS and safety professionals. Course Length: Two days for the classroom version; eight hours for the Web-based version.

Cost: \$300 per participant for the classroom version; \$175 per participant for the Web-based version.

To Access This Resource:

- For the classroom version, access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137044."
- For the Web-based version, access the website address <http://www.citeconsortium.org/courses/HighwaySafety.html> or contact Kathleen Frankle, Consortium of ITS Training and Education (CITE), (410) 414-2925, KFrankle@umd.edu.

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National ITS Architecture Section of the ITS Joint Program Office Website

This website is a compilation of resources related to the National ITS Architecture. The site links to the National ITS Architecture “browsable” online version developed by Iteris and provides instructions on how to order the document on CD-ROM. The site also contains information related to the Turbo Architecture software tool and *National ITS Architecture Security*, which presents an overview of security as it is represented in the Architecture and provides guidance for using the security-related aspects of the Architecture. In addition, the site lists other Architecture-related documents, training courses, workshops, contacts in the ITS Joint Program Office, and related links, including applicable ITS standards.

Cost: Free

To Access This Resource: Access the website address <http://www.its.dot.gov/arch/index.htm>.

<http://>

ITS Architecture Implementation Program Section of the FHWA Office of Operations Website

This website offers a Web-based resource guide on conformity with the FHWA's Final Rule and the FTA's Policy on the National ITS Architecture and Standards. The website contains the final text of both the FHWA Rule and FTA Policy, as well as frequently asked questions (with answers), fact sheets, training information, and sample architecture documents.

Cost: Free

To Access This Resource: Access the website address http://www.ops.fhwa.dot.gov/its_arch_imp/index.htm.



National ITS Architecture Field Support Team

The National ITS Architecture Field Support Team (AFST) provides short-term, on-call, or on-site technical assistance to facilitate the development, utilization, and maintenance of regional ITS architectures. The Team offers technical assistance in the following areas: customized training courses, including a basic primer on ITS architectures; pre- or post-meeting support held in conjunction with the Regional ITS Architecture Development Process Workshop; guidance materials, including examples of good regional ITS architectures; review of existing regional ITS architectures; and support for users of the Turbo Architecture software. Services are available to public sector staff at the Federal, state, and local levels.

Cost: Free

To Access This Resource: Contact the ITS Specialist at the FHWA Division Office in your state. Contact information for these individuals can be found online at http://www.ops.fhwa.dot.gov/int_its_deployment/its_specialists/fhwa_office.htm. Alternatively, contact any of the team members:

- Emiliano Lopez, FHWA Office of Transportation Management, (202) 366-2199, Emiliano.Lopez@dot.gov
- Ed Fok, FHWA Resource Center, (415) 744-0113, Edward.Fok@dot.gov

- Greg Jones, FHWA Resource Center, (404) 562-3906, Greg.M.Jones@dot.gov
- Mac Lister, FHWA Resource Center, (708) 283-3532, Mac.Lister@dot.gov
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- Donald Gedge, FHWA Division Office, (615) 781-5769, Donald.Gedge@dot.gov
- Nathaniel Price, FHWA Division Office, (503) 587-4709, Nathaniel.Price@dot.gov



The National ITS Architecture: A Framework for Integrated Transportation into the 21st Century, Version 6.0

Just as an architect's plans lay out the design of a house, the National ITS Architecture provides a master blueprint for building an integrated, multimodal, intelligent transportation system. The National ITS Architecture defines the framework around which a generally common ITS infrastructure can be developed, while ensuring that local needs are met. The Architecture helps state and local decision-makers plan smarter and buy smarter, ultimately saving time and money while making their regions more economically attractive. Available online is a "browsable" version of the Architecture developed by Iteris, which, together with a CD-ROM version, contains the complete set of documents, physical and logical architecture databases, as well as hyperlinks to assist in navigation. Both the CD-ROM and online formats also include the *National ITS Architecture Security* that presents an overview of security as it is represented in the Architecture and provides guidance for using the security-related aspects of the Architecture; the document *Regional ITS Architecture Guidance: Developing, Using and Maintaining an ITS Architecture for Your Region, Version 2.0*; and the software tool Turbo Architecture Version 4.0.

Cost: Free

To Access This Resource: Access the website address <http://www.iteris.com/itsarch>. To order the CD-ROM, contact the Operations/ITS HelpLine, (866) 367-7487, itspubs@dot.gov.



Turbo Architecture Version 4.0

Turbo Architecture is an interactive software tool for regional and project-specific ITS architecture development. By helping the user integrate multiple project architectures with a regional architecture and with each other, Turbo Architecture makes it easier to develop an architecture consistent with the National ITS Architecture. Turbo Architecture Version 4.0 which is compatible with the National ITS Architecture 6.0 and with Microsoft Vista, has added new interfaces and flows, has updated equipment package descriptions, function requirements and ITS standards information. **Cost:** Free

To Access This Resource: Turbo Architecture Version 4.0 is available as part of the National ITS Architecture Version 6.0, in both CD-ROM and online formats. For the online version, access the website address <http://www.iteris.com/itsarch/html/turbo/turbomain.htm>. To order the National ITS Architecture Version 6.0 on CD-ROM, contact the Operations/ITS HelpLine, (866) 367-7487, itspubs@dot.gov.



Regional ITS Architecture Checklist Version 3.0 (2007)

This checklist enables a reviewer to assess the completeness of and identifying improvements to a regional ITS architecture, as stated in the FHWA Rule and FTA Policy on ITS Architecture and Standards. Questions are listed by main topic area, with space for a user to make an assessment. Version 3.0 of the checklist, published in 2007, reflects improvements made after receiving feedback from past checklist users. Several questions have been reworded, series of questions reorganized, and possibly unfamiliar technical terms defined. Users are encouraged to refer to the document *Regional ITS Architecture Guidance: Developing, Using and Maintaining an ITS Architecture for Your Region, Version 2.0* when filling out this checklist.

Cost: Free

To Access This Resource: Access the website address
http://www.ops.fhwa.dot.gov/its_arch_imp/checklist.htm.



Systems Engineering for Intelligent Transportation Systems: An Introduction for Transportation Professionals (FHWA-HOP-07-069) (2007)

This handbook is an introduction to systems engineering, showing how the systems engineering (SE) process can be applied to planning, designing, and implementing ITS projects. This handbook leads the reader, step by step, through the project life cycle and discusses how SE can be applied at each step. The handbook explains how to begin implementing the SE approach on new projects and how to incorporate SE more broadly into an organization's business processes and practices. The handbook concludes with a list of resources, including ITS-specific publications, general SE references, selected SE standards, and available SE training.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://www.ops.fhwa.dot.gov/publications/seitsguide/seguide.pdf>
- HyperText Markup Language (HTML) format: <http://www.ops.fhwa.dot.gov/publications/seitsguide/index.htm>



Five-Year ITS Program Plan (FHWA-JPO-07-015) (2006)

This program plan documents the history, structure, and goals of the national ITS program. This plan describes current activities (as of 2006) and maps out investments planned for the next five years (2006-2010). Last updated in 2000, the 2006 edition outlines the significant changes that will be made to the direction for the ITS program to give greater emphasis to ITS technologies that address the Congestion Initiative. ITS technologies that facilitate congestion pricing, speed traffic flows on arterials, and enhance the value of transit will receive particular attention and resources.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS HelpLine, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14289/14289.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14289.htm, EDL# 14289



Regional ITS Architecture Guidance: Developing, Using and Maintaining an ITS Architecture for Your Region, Version 2.0 (FHWA-HOP-06-112) (2006)

This document is a guide for transportation professionals involved in the development, use, or maintenance of regional ITS architectures. The document describes a process for creating a regional ITS architecture and includes supporting examples of each architecture product. This process includes the following steps: getting started, gathering data, defining interfaces, implementation, and, finally, use and maintenance of the regional ITS architecture developed. The document contains an appendix that describes several tools available for regional ITS architecture development. In its discussion of the uses of regional ITS architectures, the document presents an approach for mainstreaming ITS into the transportation planning and project development process. This document is designed to aid regions in the development of regional architectures that comply with the FHWA's Final Rule and the FTA's Policy on the National ITS Architecture and Standards. The document provides a foundation for the two-day Regional Architecture ITS Architecture Development Process Workshop and the one-day Regional ITS Architecture Development Process Seminar.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://www.ops.fhwa.dot.gov/publications/regitsarchguide/raguide.pdf>
- HyperText Markup Language (HTML) format: <http://www.ops.fhwa.dot.gov/publications/regitsarchguide/index.htm>



Disaster Response and Evacuation User Service: An Addendum to the ITS Program Plan (2003)

This document provides a detailed description of the Disaster Response and Evacuation User Service. This document serves as an addendum to the *National ITS Program Plan* in describing the 33rd ITS user service and establishes the need for including disaster response and evacuation (DRE) in the National ITS Architecture. ITS technologies and services described in the document provide enhanced access to the scene for response personnel and resources, better information about the transportation system in the vicinity of the disaster, and more efficient and safer evacuation of the general public. ITS can also be used to prioritize, allocate, and track personnel and resources for more efficient and effective disaster response.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_pr/14064.html, EDL# 14064.



FTA National ITS Architecture Consistency Policy: Additional Grantee Guidance (2003)

In 2001, the Federal Transit Administration published its *National ITS Architecture Policy on Transit Projects* to meet the requirement in Section 5206(s) of the Transportation Equity Act for the 21st Century (TEA-21). The policy requires that ITS projects conform to the National ITS Architecture and related standards and recommended activities that transit agencies should be carrying out in order to meet the policy's requirements. This document contains additional guidance resulting from feedback received since the policy went into effect. The additional guidance recommends that transit agencies take several key steps: familiarize themselves with the policy, assess how the policy is applicable to their own projects and grants, participate in the ITS architecture development process in their own region, and develop an ITS project architecture for all major ITS projects. The additional guidance recommends that this last step be

accomplished by conducting a systems engineering analysis for the ITS and communications components of any major ITS project.

Cost: Free

To Access This Resource: Access the following website addresses:

- Cover letter from FTA Administrator: http://www.fta.dot.gov/assistance/technology/research_511.html
- Document: <http://www.fta.dot.gov/documents/dc2003.pdf>



Maintenance and Construction Operations User Service: An Addendum to the ITS Program Plan (2001)

This document provides a detailed description of the maintenance and construction operations user service. This document serves as an addendum to the *National ITS Program Plan* in describing the 32nd ITS user service and establishes the need for including maintenance and construction operations in the National ITS Architecture, focusing on four specific functions: maintenance vehicle fleet management, roadway management, work zone management and safety, and roadway maintenance conditions and work plan dissemination.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_pr/13465.pdf, EDL# 13465.



National ITS Architecture New User Service Procedure (2001)

This document describes a two-phase procedure for the introduction and integration of a new user service into the National ITS Architecture. Phase I involves stakeholders' efforts to address their transportation needs, formalize these needs into a user service, and gain acceptance within the U.S. DOT. Phase II involves the actions of the ITS Joint Program Office to integrate the new user service into the National ITS Architecture, coordinate activities with stakeholders, and ensure that the final product has stakeholder consensus and support.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13483.html, EDL# 13483.



National Intelligent Transportation Systems Program Plan: Five-Year Horizon (FHWA-OP-00-008) (2000)

This document presents the National ITS Program's goals, key activities, and milestones for the next five years. For each major area of the program—metropolitan ITS, rural and statewide ITS, commercial vehicle operations, and the Intelligent Vehicle Initiative—the document discusses current status (where we are), a vision for the future (where we are going), and strategies the program will employ to achieve its goals (how we get there).

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/11943.pdf.



Archived Data User Service (ADUS): An Addendum to the ITS Program Plan, Final Version 3.0 (1998)

This document provides a detailed description of the archived data user service (ADUS). This document serves as an addendum to the *National ITS Program Plan* in describing the 31st ITS user service and establishes the need for including data archiving in the National ITS Architecture.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_pr/5224.htm, EDL# 5224. This document is also included as an appendix in the *National Intelligent Transportation Systems Program Plan: Five-Year Horizon*.



Highway-Rail Intersection User Service (1996)

This document provides a detailed description of the highway-rail intersection ITS user service. This document serves as an addendum to the *National ITS Program Plan* in describing the 30th ITS user service and establishes the need for including highway-rail grade crossing safety in the National ITS Architecture.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_pr/12503.pdf, EDL# 12503. This document is also included as an appendix in the *National Intelligent Transportation Systems Program Plan: Five-Year Horizon*.



National ITS Program Plan (1995)

Since its publication in 1995, this document has guided development and deployment of intelligent transportation systems in the U.S. The guidance contained in this Architecture document seeks to encourage coordination, maintain focus on deployment, and ensure that ITS is intermodal. The strategy for accomplishing these goals is the formal definition of the National ITS Program in terms of 29 ITS user services. These user services form the basis upon which the National ITS Architecture was developed. A Synopsis provides a 50-page encapsulation of the major subject areas within the *National ITS Program Plan*, with special emphasis on deployment. Volume I focuses on the origins of the National ITS Program, user services, compatibility, deployment, and program assessment. Volume II contains detailed descriptions of each of the 29 original ITS user services.

Cost: Free

To Access This Resource: Access the following website addresses:

- Synopsis: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_pr/3845.pdf, EDL# 3845
- Volume I: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_pr/3827.pdf, EDL# 3827
- Volume II: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_pr/3786.pdf, EDL# 3786



ITS Architecture Use and Maintenance Workshop

This two-day workshop will help participants understand how a regional ITS architecture can be used in regional and statewide transportation planning and project deployment. Participants will gain insight into the decisions and process steps involved in maintaining a regional ITS architecture. Workshops will be customized for individual regions, with a single workshop involving all stakeholders from a given region. This interactive workshop will be facilitated by the National ITS Architecture Team using lectures, discussions and group exercises. Exercises will guide participants on how to use their own region's ITS architecture to support long-range transportation planning, identify ITS projects, support programming and budgeting of these projects, support systems engineering, support project implementation, and maintain the architecture, i.e., keep it relevant to changing circumstances.

Cost: Free. Host organization is responsible for providing a meeting room and refreshments.

To Access This Resource: Contact the ITS Specialist at the FHWA Division Office in your state. Contact information or these individuals can be found online at http://www.ops.fhwa.dot.gov/int_its_deployment/its_specialists/fhwa_office.htm.



Regional ITS Architecture Development Process Workshop

This two-day workshop will equip ITS professionals with the tools to develop their own regional ITS architecture by helping them prepare a customized action plan to guide them through the process. The discussions will address both technical and institutional issues that stakeholders may encounter during the regional ITS architecture development process. The workshop is conducted in roundtable format, with extensive discussions of situations specific to the participants' own particular region. Participants are expected to be knowledgeable about the National ITS Architecture, as well as their region's transportation planning process. Participants will leave the workshop with a customized action plan, which they can then use as a roadmap to develop their own regional ITS architecture. A single workshop

can accommodate from one to four regions, with ITS architecture champions and key stakeholders attending.

Cost: Free. Host organization is responsible for providing a meeting room and refreshments.

To Access This Resource: Contact the ITS Specialist at the FHWA Division Office in your state. Contact information for these individuals can be found online at http://www.ops.fhwa.dot.gov/int_its_deployment/its_specialists/fhwa_office.htm.



Regional ITS Architecture Development Process Seminar

This one-day seminar will equip ITS professionals with the information needed to develop their own regional ITS architecture. The seminar will focus on the six-step process described in the document *Regional ITS Architecture Guidance: Developing, Using and Maintaining an ITS Architecture for Your Region, Version 2.0*. The seminar will address both technical and institutional issues often encountered during the regional ITS architecture development process.

Cost: Free. Host organization is responsible for providing a meeting room and refreshments.

To Access This Resource: Contact the ITS Specialist at the FHWA Division Office in your state. Contact information for these individuals can be found online at http://www.ops.fhwa.dot.gov/int_its_deployment/its_specialists/fhwa_office.htm.



Using the National ITS Architecture for Deployment (NHI Course# 137013)

The objective of this course is to demonstrate in an interactive workshop format how to apply tools and methodologies developed by the National ITS Architecture Team for the U.S. DOT. Topics covered include: transportation services, subsystems and terminators, information flows, market packages, ITS standards, developing an ITS architecture, logical architecture, using an architecture for project deployment, user service requirements and the theory of operations, and the FHWA's Final

Rule and FTA's Policy on ITS Architecture and Standards. Skill Level: Core learning. Target Audience: This course is primarily for a public sector audience involved in ITS planning, deployment, and operations; systems integrators from the private sector would also benefit. Course Length: Two days.

Cost: \$300 per participant. The course fee includes a copy of the National ITS Architecture Version 6.0 on CD-ROM.

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137013."



Turbo Architecture Software Training (NHI Course# 137029A)

This course provides training on how to use Turbo Architecture, which is a software tool for regional and project-specific architecture development. Target Audience: Public sector transportation professionals at the state, county, city, and metropolitan planning organization (MPO) levels, as well as private sector consultants, who are developing regional and project architectures. Skill Level: Specialized training. Course Length: Two days.

Cost: \$300 per participant. The sponsoring organization is responsible for providing 400 Mhz microcomputers running Windows SE or better, color monitors, and a hard disk with 50 Mb free storage memory.

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137029A."



Introduction to the National ITS Architecture

This Web-based distance learning course provides students with a broad overview of the National ITS Architecture and the role it plays in planning, designing, and implementing ITS. The course provides background (what the National ITS Architecture is, how it is defined, why it was established, and its goals and objectives) and introduces the concept of ITS user services. Basic concepts and models of systems engineering are addressed, as well as the

physical architecture through examples of local implementation of National ITS Architecture. Specific elements of the physical architecture, such as subsystems and terminators, are presented in detail. Skill Level: Awareness learning. Target Audience: Transportation professionals wanting to enhance their knowledge of and skills for using the National ITS Architecture. Course Length: Eight hours.

Cost: \$75 per participant

To Access This Resource: Access the website address <http://www.citeconsortium.org/courses/initisa.html> or contact Kathleen Frankle, Consortium of ITS Training and Education (CITE), (410) 414-2925, KFrankle@umd.edu.



Procurement Practices Points-of-Contact

- Mac Lister, FHWA Resource Center, (708) 283-3532, Mac.Lister@dot.gov
- Emiliano Lopez, FHWA Office of Transportation Management, (202) 366-2199, Emiliano.Lopez@dot.gov
- Aletha Goodine, FTA Office of Mobility Innovation, (202) 366-6678, Aletha.Goodine@dot.gov



Software Program Managers Network Website

The site presents, in a concise format, 16 best practices that government managers can use in large-scale acquisition projects that involve software. Each of the 16 best practices are presented with “what you need to know” essential facts and “how to” implementation guidelines. The site also contains 23 lessons learned that address various aspects of software acquisition. The website calls the 16 best practices “Critical Software Practices™,” grouped into the areas of project integrity, construction integrity, and product stability and integrity. This website was developed as part of a project funded by the Navy that ran from 1992 to 2001. Some of the best practices and lessons learned are specific to a defense environment, but others are equally applicable to ITS projects.

Cost: Free

To Access This Resource: Access the website address <http://www.spmn.com>.



Guide to Contracting ITS Projects

This online software tool assists the user in applying an eight-step decision model for procurement of ITS products and services presented in NCHRP Report# 560 *Guide to Contracting ITS Projects*. Steps include assessment of the complexity and risk of ITS project for which the procurement is taking place, selection of applicable systems engineering processes and procurement packages, and defining the scope, terms and conditions of a final contract. The tool uses an interactive and checklist format to

walk the user through various steps and decision points. Users are strongly encouraged to read *Guide to Contracting ITS Projects* before using the software tool.

Cost: Free

To Access This Resource: Access the website address <http://www.trb.org/nchrp/its/index.htm>.



Guide to Contracting ITS Projects (NCHRP Report# 560) (2006)

This report presents an eight-step decision model for procurement of ITS products and services. Steps include: assessment of the complexity and risk of an ITS project for which the procurement is taking place, selection of applicable systems engineering processes and procurement packages, and defining the scope, terms and conditions of a final contract. A companion report *Considerations for a Guide to Contracting ITS Projects* describes the approach taken by the research team to develop the decision model and presents several interim findings. A companion software tool assists the user in applying the eight-step decision model.

Cost: \$30 for the hardcopy version of *Guide to Contracting ITS Projects*; the online versions of both reports are free.

To Access This Resource: To order the hardcopy version of *Guide to Contracting ITS Projects*, contact the Transportation Research Board (TRB) Bookstore at <http://www.trb.org/bookstore> and search for "NR560," (202) 334-3213, fax: (202) 334-2519. For the online version of both reports, access the following website addresses:

- Guide to Contracting ITS Projects: http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_560.pdf
- Considerations for a Guide to Contracting ITS Projects: http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_w85.pdf



Factors in Decisions to Make, Purchase, and Use On-board Safety Technologies (FMCSA-MCRT-06-003) (2005)

This report documents the findings of a study of what motivates key commercial vehicle stakeholders when making decisions to manufacture, buy or use on-board safety technologies. Telephone interviews were conducted with several individuals representing a wide range of stakeholders: 19 motor carriers, five insurance companies, two associations, one driver training program. Factors identified in making manufacturing, purchase and use decisions include return on investment, demonstrated effectiveness to improve safety, reliability, maintainability, liability, market demand, initial cost, market image, driver acceptance, and ease of integrating the new technology into the existing layout of the commercial vehicle cab.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://www.fmcsa.dot.gov/facts-research/research-technology/report/factors-in-decisions.pdf>
- HyperText Markup Language (HTML) format: <http://www.fmcsa.dot.gov/facts-research/research-technology/report/factors-in-decisions.htm>



Specification Guide for Procurement of NTCIP-Compliant Dynamic Message Signs (DMS) (2002)

This document provides guidance on how to procure dynamic message signs that are compliant with the National Transportation Communications for ITS Protocol (NTCIP) 1203 Dynamic Message Signs v1 standard. The guide contains an overview of the NTCIP standard, an explanation of the need to include particular information when developing an NTCIP specification for dynamic message signs, a suggested outline for procurement specifications, and sample text for inclusion in the specifications.

Cost: Free

To Access This Resource: Access the website address <http://www.standards.its.dot.gov/Documents/genDMSSpec.pdf>.



Successful Traffic Signal System Procurement Techniques: A Summary of Effective Processes (FHWA-OP-02-032) (2002)

Traffic signal systems are benefiting from the micro-computing and technology explosion of the past several decades. These new systems are more adaptable and more reliable than traffic signal systems of the past. However, these new technologies, and the capabilities enabled by them, introduce difficulties in procurement. Agencies are finding that these systems, equipment, and software do not meet their expectations for functionality and maintainability. In addition, it has become more difficult to manage the budget and schedule of a traffic signal system installation project. This document outlines a suggested procurement methodology that can support agencies in defining their signal systems needs and communicating those needs in a procurement.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13611.html.



Procurement Case Studies (2000)

This series of four case studies examines procurement approaches used to deliver ITS projects. The purpose of this series is to provide examples of successful strategies that have been used to overcome challenges to ITS procurement contained within the traditional design-bid-build approach.

Cost: Free

To Access This Resource: Access the following website addresses:

- Georgia's Intelligent Transportation System NaviGator Systems Integrator Contract—Use of a Systems Integrator to Manage ITS Implementation (FHWA-OP-01-019):
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13459.pdf, EDL# 13459
- Michigan Intelligent Transportation System Center—Use of a Design/Build/Warranty Contract (FHWA-OP-01-020):
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13460.pdf, EDL# 13460

- The Las Vegas Freeway and Arterial Management System—Use of a Systems Manager Contractor to Procure ITS (FHWA-OP-01-021): http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13461.pdf, EDL# 13461
- CHART II Software Upgrade—Using a Design Competition to Procure ITS Software (FHWA-OP-01-022): http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13462.pdf, EDL# 13462



ITS Software: Effective Acquisition Practices (2000)

This report presents the results of a study on effective software acquisition practices for intelligent transportation systems. This document was prepared under the guidance of the National Cooperative Highway Research Program (NCHRP). This report presents the results of surveys, interviews, and roundtable discussions with transportation officials and contractors at the state and local levels. The report examines the types of software acquisition projects that agencies are undertaking, problems they have encountered during the process, and techniques they are using or have used to deal with these problems. The report also discusses software acquisition and engineering techniques that have proven effective in other industries and in non-transportation government sectors.

Cost: \$68 for members of the Association of American State Highway and Transportation Officials (AASHTO); \$80 for non-members.

To Access This Resource: Contact the AASHTO Bookstore, (800) 231-3475, fax: (800) 525-5562, <http://bookstore.transportation.org> and search for “ITS-1.”



What's Yours, Mine, and Ours— Overcoming Intellectual Property Rights Issues: A Cross-Cutting Study (FHWA-OP-99-021/FTA-TRI-11-99-11) (2000)

This report is one in a series designed to educate public sector managers about particular ITS technologies. Debate over ownership of intellectual property rights has caused substantial setbacks in some ITS projects, delaying the time that innovations can be commercialized and accessible to all jurisdictions. However, there are solutions to these daunting problems. This report explores how the public and private sector partners in the Phoenix and San Antonio Metropolitan Model Deployment Initiative (MMDI) efforts successfully came to agreement on intellectual property rights.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/11486.pdf.



The Road to Successful ITS Software Acquisition (1998)

This document assembles best practices and presents useful advice on how to acquire software components of intelligent transportation systems. The intended audience is customers of software vendors—project leaders, technical contract managers, decision-makers, and consultants. The document presents a series of themes that serve as guiding principles for achieving a successful software acquisition, including themes based on people, management, and systems. Software acquisition activities that build upon these themes are presented in subsequent chapters. Among the activities covered are building a team, developing requirements, making build/buy decisions, resolving intellectual property rights issues, acceptance testing, and project and risk management. Also included are case studies to illustrate the various points, as well as key point summaries and checklists to facilitate use of the material. The document concludes with brief stand-alone topic sheets that review issues related to software acquisition.

Cost: Free

To Access This Resource: Access the following website addresses:

- Executive Summary: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/4132.pdf, EDL# 4132
- Volume I: Overview and Themes (FHWA-JPO-98-035): http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/4130.pdf, EDL# 4130
- Volume II: Software Acquisition Process Reference Guide (FHWA-RD-98-036): http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/4131.pdf, EDL# 4131



Guidebook for Selecting Technology for Rural and Small Urban Public Transportation Systems (TCRP Report# 76) (2002)

This guidebook helps public transportation professionals identify appropriate technologies for their transit systems, which can range from off-the-shelf computer software to automatic vehicle location (AVL) systems. The guidebook encourages readers to conduct a self-assessment of the services, character, and environment of their own transit system in order to select the technology best suited to their needs. The guidebook lists grants and revenue sources that can be used to pay for these technologies. Finally, the guidebook offers recommendations on developing an implementation plan, conducting the procurement process, and installing the new technology system.

Cost: \$17 for the hardcopy version; the online version is free.

To Access This Resource: To order the hardcopy version, contact the Transportation Research Board (TRB) Bookstore at <http://www.trb.org/bookstore> and search for "TC076," (202) 334-3213, fax: (202) 334-2519. For the online version, access the website address http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_76.pdf.



A Handbook for Acquiring Demand-Responsive Transit Software (TCRP Report# 18) (1996)

This handbook is intended to assist providers of demand-responsive transit (DRT) in the selection, acquisition, and implementation of software for DRT operations and administration. The purpose of this handbook is to advise providers of DRT services about computer software and other technology appropriate for DRT applications, and to assist software vendors in understanding the market for DRT software and technologies.

Cost: \$26 for the hardcopy version; the online version is free.

To Access This Resource: To order the hardcopy version, contact the Transportation Research Board (TRB) Bookstore at <http://www.trb.org/bookstore> and search for "TC018," (202) 334-3213, fax: (202) 334-2519. For the online version, access the website address http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_18.pdf.



ITS Software Acquisition (NHI Course# 137019)

This course provides a general understanding of the many issues involved in the development, management, and deployment of ITS software. Topics covered include the challenges software projects present and how to overcome them, the guiding principles to use for acquiring software successfully, and selection of an appropriate contracting mechanism. Skill Level: Core learning. Target Audience: State and local personnel, such as project leaders, who will be involved in ITS projects that have a significant software component to them. FHWA Resource Center and Division office personnel who are involved in coordinating these projects would also benefit. Course Length: Two days.

Cost: \$300 per participant

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137019."



Intelligent Transportation System (ITS) Procurement (NHI Course# 137020)

This seminar is intended to heighten awareness of the challenges in procuring ITS within the traditional construction project environment. This seminar combines lectures with presentations of case studies to describe the lessons learned from past ITS projects, and explain how best practices can be instituted to help ensure successful ITS procurement. This seminar is not a prerequisite, but a companion to ITS Software Acquisition. Skill Level: Core learning. Target Audience: Federal, state, and local transportation professionals directly involved in procuring ITS systems, especially those responsible for developing and reviewing statements-of-work for ITS procurement, including program managers, contracting officers, and attorneys. Course Length: One day.

Cost: \$200 per participant

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number “137020.”



Introduction to Systems Engineering for Advanced Transportation (NHI Course# 137024)

This course provides an introduction to systems engineering for ITS project managers and staff, allowing participants to understand the benefits of applying systems engineering approaches to developing quality systems. The course covers both technical practices (modeling, prototyping, trade-off analysis, and testing) and management practices (risk analysis and mitigation). Skill Level: Core learning. Target Audience: Transportation engineers and other information technology (IT) professionals and technical staff at all levels of the public and private sectors, including ITS project managers, technical team members, contractors, and staff. Project managers in particular may benefit from this course. This course is available in classroom, Web-based and blended instructor-led/Web-based versions. Course Length: Two days for the classroom version; 10 hours for the Web-based and blended versions.

Cost: \$300 per participant for the classroom version; \$175 per participant for the Web-based version; \$250 per participant for the blended version.

To Access This Resource:

- For the classroom version, access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137024."
- For the Web-based and blended versions, access the website address <http://www.citeconsortium.org/courses/SE101.html> or contact Kathleen Frankle, Consortium of ITS Training and Education (CITE), (410) 414-2925, KFrankle@umd.edu.



Managing High Technology Projects in Transportation (NHI Course# 137026)

The goal of this course is to improve the project management skills of both public and private sector personnel responsible for managing the implementation of technology-intensive transportation projects. The course provides training on the fundamental principles and practices of good project management; the steps to be taken for the planning, design, and implementation of transportation systems projects; the types of project management tools available; and the basic skills required to be a good project manager. Skill Level: Core learning. Target Audience: Current and prospective project managers from state and local transportation agencies, as well as those in the private sector who support the implementation of advanced transportation projects. Course Length: Two days. This course is available in classroom, Web-based and blended instructor-led/ Web-based versions. Course Length: Two days for the classroom version; eight hours for the Web-based and blended versions.

Cost: \$300 per participant for the classroom version; \$200 per participant for the Web-based version; \$250 per participant for the blended version.

To Access This Resource:

- For the classroom version, access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137026."

- For the Web-based and blended versions, access the website address <http://www.citeconsortium.org/courses/2mod11.html> or contact Kathleen Frankle, Consortium of ITS Training and Education (CITE), (410) 414-2925, KFrankle@umd.edu.



Configuration Management (CM) for Traffic Management Systems (NHI Course# 137042)

Configuration management (CM) is the practice of handling changes systematically so that a facility maintains its integrity over time. CM involves policies, procedures, techniques, and tools to manage and evaluate proposed project changes, track the status of changes, and maintain an inventory of system and support documents. This course presents issues surrounding CM and recommended practices for agencies to consider in a modular manner. A two-day version of the course presents all 10 modules. The sponsor may select modules to be presented in the one-day version of the course. Target Audience: Any individual involved in the planning, design, implementation, management, operation, or maintenance of transportation systems, including representatives of metropolitan planning organizations, traffic management centers, state and local governments, FHWA, universities, and consultants. Course Length: Two days.

Cost: \$300 per participant

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137042."



DMS Procurement Workshop

This workshop discusses the nuts and bolts of a successful dynamic message sign (DMS) procurement. Participants will learn to develop methods for incorporating National Transportation Communications for ITS Protocol (NTCIP) standards into their DMS specifications. The workshop gives participants practical, ready-to-use information on a full range of topics related to the procurement of standards-based DMS systems. Target Audience: Public and private sector professionals responsible for

specifying and procuring ITS-related equipment and services. Transportation/ITS engineers, project managers, technical team members (specification writers), consultants, contractors, and operators will all benefit from the workshop. Course Length: Two days.

Cost: Free

To Access This Resource: Access the website address http://www.ops.fhwa.dot.gov/int_its_deployment/standards_imp/dmswkshp.htm or contact Tom Stout, FHWA Office of Transportation Management, (202) 366-6054, Tom.Stout@dot.gov.



Guidelines for Successful ITS Procurement

This course presents the eight-step decision model for procurement of ITS products and services presented in NCHRP Report# 560 *Contracting for ITS Projects*, as well as a Web-based software tool of the same name. Steps in the decision model include assessment of the complexity and risk of ITS project for which the procurement is taking place, selection of applicable systems engineering processes and procurement packages, and defining the scope, terms and conditions of a final contract. This interactive Web-based training course ("webinar"), offered March 15, 2006, has been archived in several formats: the MS PowerPoint presentation given, a transcript that includes the question and answer period, and an audio recording with simultaneous text captioning.

Cost: Free

To Access This Resource: Access the following website addresses:

- MS PowerPoint presentation: http://www.pcb.its.dot.gov/T3/session29/T3_S29_ppt.ppt
- Transcript in HyperText Markup Language (HTML) format: <http://www.pcb.its.dot.gov/t3/session29/session29text.asp>
- Audio recording using Macromedia® Flash®: http://www.pcb.its.dot.gov/T3/session29/T3_S29_Flash.html



What Executives Need to Know About Software Acquisitions

This course presents eight practical steps government executives can take to successfully manage ITS projects that involve acquiring software. Successful practices include providing adequate resources, fostering teaming, attempting to “buy instead of build,” breaking the project into pieces, selecting the right vendor and contracting mechanism, resisting schedule pressure, and emphasizing software quality from the start of the project. This interactive Web-based training course (“webinar”), offered July 12, 2006, has been archived in several formats: the MS PowerPoint presentation given, a transcript that includes the question and answer period, and an audio recording with simultaneous text captioning.

Cost: Free

To Access This Resource: Access the following website addresses:

- MS PowerPoint presentation: http://www.pcb.its.dot.gov/t3/session34/S34_ppt.ppt
- Transcript in HyperText Markup Language (HTML) format: <http://www.pcb.its.dot.gov/t3/session34/session34text.asp>
- Audio recording using Macromedia® Flash®: <http://www.pcb.its.dot.gov/t3/session34/T3%20-%20July%2012,%202006.html>



Program Assessment and Evaluation Points-of-Contact

- Jane Lappin, ITS Joint Program Office/Volpe National Transportation Systems Center, (617) 494-3692, Lappin@volpe.dot.gov
- Charlene Wilder, FTA Service Innovation Division, (202) 366-1077, Charlene.Wilder@dot.gov

<http://>

Evaluation Section of the ITS Joint Program Office Website

This website is a compilation of resources related to ITS evaluation and program assessment. The site contains a definition of ITS program assessment and evaluation, guidelines on how to evaluate ITS projects, and guidelines on how to collect information on unit and life-cycle costs of ITS technologies. The site organizes by topic area links to over 400 ITS evaluation-related documents available online. Types of documents posted on the site include evaluation plans, evaluation strategies, detailed test plans, and final reports of evaluation results.

Cost: Free

To Access This Resource: Access the website address <http://www.its.dot.gov/evaluation/index.htm>.

<http://>

International Benefits, Evaluation and Costs (IBEC) Working Group Website

This website is the official site of the International Benefits, Evaluation and Costs (IBEC) Working Group, a group of more than 350 ITS professionals from over 40 countries around the world. IBEC is a forum for information exchange on techniques used to evaluate the costs and benefits of ITS and the results of those evaluations. The site contains news of upcoming events, including IBEC-sponsored sessions at the ITS America Annual Meeting, ITS in Europe conference, and the annual ITS World Congress. The site library contains presentations given at these sessions, as well as proceedings from IBEC-sponsored events at past ITS World Congresses dating back to 1999. From the site's links section, the user can access the websites of ITS professional associations for dozens of countries and regions throughout the world.

Cost: Free

To Access This Resource: Access the website address
<http://www.ibec-its.org>.



ITS Benefits Database

This database contains information regarding the impacts of ITS projects on the operation of the surface transportation network. Entries are brief summaries of ITS benefits—in the areas of safety, efficiency, mobility, productivity, environmental impacts, and customer satisfaction—reported in printed and online sources. At present, the database contains more than 200 entries. Reference information is provided with each entry, along with the link to the reference document if available electronically. Users can search the database by ITS component, performance measure, project location, and date submitted. Several other documents pertaining to ITS benefits are also available for downloading, including a one-page ITS benefits desk reference. Users are invited to contribute new information, and the website has instructions on how to do so.

Cost: Free

To Access This Resource: Access the website address
<http://www.itsbenefits.its.dot.gov>.



ITS Costs Database

This database contains estimates of ITS costs that can be used for policy analysis and benefit/cost analysis. At present, the database contains unit cost estimates of more than 200 ITS technologies, as well as system costs for selected ITS deployments. The unit cost database is available online, and as an Excel spreadsheet. Users can search the database of system costs by ITS component, project location, and date submitted. Several other documents pertaining to ITS benefits are also available for downloading, including a national ITS costs working paper. Users are invited to contribute new information, and the website has instructions on how to do so.

Cost: Free

To Access This Resource: Access the website address
<http://www.itscosts.its.dot.gov>.



ITS Lessons Learned Knowledge Resource

The Lessons Learned Knowledge Resource (LLKR) is a repository of experience on how to plan, design, deploy, operate, and maintain ITS. The LLKR provides a mechanism for those who came before to share their hard-earned wisdom with those encountering similar challenges for the first time. At present, the LLKR contains over 300 lessons. Users can search the LLKR by ITS component, project location, nine topic areas, and many other factors. The nine topic areas are management and operations, policy and planning, design and deployment, leadership and partnerships, funding, technical integration, procurement, legal issues, and human resources. Users are invited to contribute new information, and the website has instructions on how to do so.

Cost: Free

To Access This Resource: Access the website address
<http://www.itslessons.its.dot.gov>.



ITS Deployment Statistics Database

Now in its eighth year, the ITS Deployment Tracking effort surveys practitioners from across the country to measure progress toward National ITS Program goals. The ITS Deployment Statistics website contains the results of this multi-year survey effort. Last updated with 2005 data, this database contains results from several recent surveys: ITS technologies deployed in 30 medium-size cities, 20 tourist cities, and the 78 largest metropolitan areas, as well as statewide and rural ITS systems deployed in all 50 states. Users can view survey results by component and by city or state, view blank surveys, and review the precise definitions used to determine how much ITS is deployed in each city or state. Users can also download detailed reports for each city and state, as well as a national report.

Cost: Free

To Access This Resource: Access the website address
<http://www.itsdeployment.its.dot.gov>.



Advanced Parking Management Systems: A Cross-Cutting Study (FHWA-JPO-07-011) (2007)

This report is one in a series designed to educate public sector managers about particular ITS technologies. This report explains how ITS technologies can be used to inform travelers about where the best parking locations are, what hours they are open, what fees they charge, and, most importantly, whether a parking space will be available when they arrive. This report presents the full range of advanced parking management systems (APMS) technologies, from low-tech solutions such as a parking information website to cutting-edge parking reservation systems that enable drivers to locate, reserve, and pay for a parking space all through wireless communications. The report profiles advanced parking management systems in Washington State, Illinois, and Maryland. The study concludes with a summary of the benefits and costs of this new technology, as well as lessons learned in the areas of policy and planning, design and deployment, and management and operations.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS Helpline, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14318_files/14318.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14318.htm, EDL# 14318



Intelligent Transportation Systems for Traffic Incident Management: Deployment Benefits and Lessons Learned (FHWA-JPO-07-001) (2007)

This leaflet is one in a series that shows how ITS technologies can reduce congestion, in support of the U.S. Department of Transportation's Congestion Initiative. This leaflet summarizes the benefits, costs, extent of deployment and lessons learned about the use of ITS for traffic incident management. The online version

contains a full list of sources, so that all information in the leaflet's brief four pages is backed up with supporting documentation.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS HelpLine, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.its.dot.gov/jpodocs/repts_te/14288_files/14288.pdf
- HyperText Markup Language (HTML) format: http://www.its.dot.gov/jpodocs/repts_te/14288.htm, EDL# 14288



Intelligent Transportation Systems for Traffic Signal Control: Deployment Benefits and Lessons Learned (FHWA-JPO-07-004) (2007)

This leaflet is one in a series that shows how ITS technologies can reduce congestion, in support of the U.S. Department of Transportation's Congestion Initiative. This leaflet summarizes the benefits, costs, extent of deployment and lessons learned about the use of ITS for traffic signal control. The online version contains a full list of sources, so that all information in the leaflet's brief four pages is backed up with supporting documentation.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS HelpLine, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.its.dot.gov/jpodocs/repts_te/14321_files/14321.pdf
- HyperText Markup Language (HTML) format: http://www.its.dot.gov/jpodocs/repts_te/14321.htm, EDL# 14321



Intelligent Transportation Systems for Traveler Information: Deployment Benefits and Lessons Learned (FHWA-JPO-07-002) (2007)

This leaflet is one in a series that shows how ITS technologies can reduce congestion, in support of the U.S. Department of Transportation's Congestion Initiative. This leaflet summarizes the benefits, costs, extent of deployment and lessons learned about the use of ITS for providing accurate, timely traveler information. The online version contains a full list of sources, so that all information in the leaflet's brief four pages is backed up with supporting documentation.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS Helpline, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.its.dot.gov/jpodocs/repts_te/14319_files/14319.pdf
- HyperText Markup Language (HTML) format: http://www.its.dot.gov/jpodocs/repts_te/14319.htm, EDL# 14319



Intelligent Transportation Systems for Work Zones: Deployment Benefits and Lessons Learned (FHWA-JPO-07-003) (2007)

This leaflet is one in a series that shows how ITS technologies can reduce congestion, in support of the U.S. Department of Transportation's Congestion Initiative. This leaflet summarizes the benefits, costs, extent of deployment and lessons learned about the use of ITS in work zones. The online version contains a full list of sources, so that all information in the leaflet's brief four pages is backed up with supporting documentation.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS Helpline, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.its.dot.gov/jpodocs/repts_te/14320_files/14320.pdf

- HyperText Markup Language (HTML) format:
http://www.its.dot.gov/jpodocs/repts_te/14320.htm, EDL# 14320



ITS Applications for Coordinating and Improving Human Services Transportation: Brochures (2006)

These two brochures are part of a series designed to educate public sector managers about particular ITS technologies. These brochures profile ITS technologies used in providing human services transportation to special populations—older adults, people with disabilities and low-income individuals—sometimes called “transportation disadvantaged.” One brochure focuses on the benefits of these technologies to passengers; another focuses on the benefits to transit agencies.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS HelpLine, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Better Public Transportation Options for Everyone—Technologies to Improve Accessibility and Service of Public Transportation (FHWA-JPO-05-046)—Adobe Acrobat format:
http://www.itsdocs.fhwa.dot.gov/jpodocs/brochure/14138_files/14138.pdf
- Better Public Transportation Options for Everyone—Technologies to Improve Accessibility and Service of Public Transportation—HyperText Markup Language (HTML) format:
<http://www.itsdocs.fhwa.dot.gov/jpodocs/brochure/14138.htm>, EDL# 14138
- Improving Transit Equity, Streamlining Operations—Technologies That Benefit the Transportation Disadvantaged (FHWA-JPO-05-055)—Adobe Acrobat format:
http://www.itsdocs.fhwa.dot.gov/jpodocs/brochure/14139_files/14139.pdf
- Improving Transit Equity, Streamlining Operations—Technologies That Benefit the Transportation Disadvantaged—HyperText Markup Language format:
<http://www.itsdocs.fhwa.dot.gov/jpodocs/brochure/14139.htm>, EDL# 14139



ITS Applications for Coordinating and Improving Human Services Transportation: A Cross-Cutting Study (FHWA-JPO-05-056) (2006)

This report is one in a series designed to educate public sector managers about particular ITS technologies. This study profiles six examples of ITS technologies used in providing human services transportation to special populations—older adults, people with disabilities and low-income individuals—sometimes called “transportation disadvantaged.” This study examines in depth six examples of the use of ITS technologies to coordinate and improve all aspects of transportation provided to these groups: operations, information dissemination, fare payment, safety and security. The study concludes with keys to success and lessons learned from the six sites.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS HelpLine, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14140_files/14140.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14140.htm, EDL# 14140



Traffic Signal Preemption for Emergency Vehicles: A Cross-Cutting Study (FHWA-JPO-05-010) (2006)

This report is one in a series designed to educate public sector managers about particular ITS technologies. Emergency vehicle preemption (EVP) systems give emergency response vehicles a green light on their approach to a signalized intersection while providing a red light to conflicting approaches. This report examines how transportation, police, fire/rescue and emergency medical services (EMS) officials in three local jurisdictions—Fairfax County, Virginia; Plano, Texas; and St. Paul, Minnesota—used EVP to improve emergency vehicle response time, improve safety and

lower costs. The report discusses who is using EVP nationwide and what are the technology options, as well as benefits, costs lessons learned from their implementation.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS HelpLine, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14097_files/14097.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14097.htm, EDL# 14097



Archived Data Management Systems: A Cross-Cutting Study (FHWA-JPO-05-044) (2005)

This report is one in a series designed to educate public sector managers about particular ITS technologies. Archived data management systems (ADMSs) use data generated by ITS technologies in transportation planning and operations. This report examines six ADMSs in depth, discussing their design considerations, operational practices, benefits, and costs.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS HelpLine, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14128/14128.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14128.htm, EDL# 14128.



Benefits and Costs of Full Operations and ITS Deployment (2005)

Before this series of reports was published, while many evaluations had been conducted on the benefits and costs of transportation operations and ITS strategies working in isolation, there had

been few examinations of multiple strategies working together throughout a metropolitan area. This series uses the latest simulation techniques to assess the potential benefits and costs of “full deployment” of ITS and transportation operations in three metropolitan areas: Cincinnati, Seattle and Tucson. These areas represent a wide range of various factors, including city size, climate and road network pattern. The simulations used two different forecast years: present day (2003) and far off in the future (2025). In addition, in one of the cities, the effectiveness of ITS and operations strategies was studied under varying work zone and weather conditions, a departure from typical transportation planning models. All three forecasts found the benefits of operations and ITS to far outweigh the costs: 6.3 to 1 in Tucson, 11.8 to 1 in Cincinnati and 12.2 to 1 in Seattle.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS HelpLine, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Cincinnati (FHWA-JPO-04-031)—Adobe Acrobat format:
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13979_files/J001.502_Cincy.pdf
- Cincinnati—HyperText Markup Language (HTML) format:
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13979.htm,
EDL# 13979
- Seattle (FHWA-JPO-04-033)—Adobe Acrobat format:
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13977_files/J001.501_Seattle.pdf
- Seattle—HyperText Markup Language format:
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13977.htm,
EDL# 13977
- Tucson (FHWA-JPO-04-032)—Adobe Acrobat version: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13978_files/J001.503_Tucson.pdf
- Tucson—HyperText Markup Language format:
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13978.htm,
EDL# 13978



Intelligent Transportation Systems Benefits, Costs, and Lessons Learned: 2005 Update (FHWA-JPO-05-002) (2005)

This report is the latest in a biannual series that provides a synthesis of the information collected by U.S. DOT on the impact of ITS projects on the operation of the surface transportation network. The report presents ITS impacts according to program areas within the intelligent infrastructure and intelligent vehicle applications. ITS benefits are classified by performance measures associated with National ITS Program goals, i.e., the improvement of safety, efficiency, mobility, productivity, and energy/environmental impacts. The report also presents unit cost figures for selected ITS deployments, as well as sample system cost information. New in the 2005 edition is a discussion of the ITS Lessons Learned Knowledge Resource, a repository of experience on how to plan, design, deploy, operate, and maintain ITS. Information in the report is drawn from the ITS Benefits and Costs Databases, available online at <http://www.benefitcost.its.dot.gov>. A new edition, which will include data on the extent of U.S. deployment of ITS technologies, is scheduled for publication fall 2008.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS HelpLine, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14073_files/14073.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14073.htm, EDL# 14073



CVISN for Commercial Vehicles (2004)

These two reports are part of a series designed to educate public and private sector managers about particular ITS technologies. These case studies provide an in-depth view of the deployment of Commercial Vehicle Information Systems and Networks (CVISN) electronic credentialing and safety information exchange in Washington State and Connecticut. These studies describe

benefits, successful practices, and lessons learned in operations and management from the point of view of early CVISN-adopting states.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS HelpLine, (866) 367-7487 or itspubs@dot.gov. For the online version, access the following e-mail addresses:

- CVISN Electronic Credentialing for Commercial Vehicles in Washington State: A Case Study (FHWA-JPO-04-029/FMCSA-RT-04-001)—Adobe Acrobat format:
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13980_files/washington.pdf
- CVISN Electronic Credentialing for Commercial Vehicles in Washington State: A Case Study—HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13980.htm, EDL# 13980
- CVISN Safety Information Exchange for Commercial Vehicles in Connecticut: A Case Study (FHWA-JPO-04-030/FMCSA-RT-04-002)—Adobe Acrobat format:
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13981_files/Connecticut.pdf
- CVISN Safety Information Exchange for Commercial Vehicles in Connecticut: A Case Study—HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13981.htm, EDL# 13981



Intelligent Transportation Systems in Work Zones: Case Studies (2004)

These four reports are part of a series designed to educate public sector managers about particular ITS technologies. These case studies examine how transportation authorities in Arizona, Illinois, Michigan, and New Mexico used ITS in their work zones to improve mobility and reduce crashes. Each case study describes the work zone, how the ITS system was selected, how it worked, the benefits experienced, and lessons learned.

Cost: Free

To Access This Resource: To order a hardcopy, contact the Operations/ITS HelpLine, (866) 367-7487 or

workzonepubs@dot.gov. For the online version, access the following website addresses:

- Work Zone Traffic and Incident Management System (FHWA-OP-04-072)—Adobe Acrobat format:
http://www.ops.fhwa.dot.gov/wz/technologies/albuquerque/its_albuquerque.pdf
- Work Zone Traffic and Incident Management System—HyperText Markup Language (HTML) format:
http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13941.html, EDL# 13941 or <http://www.ops.fhwa.dot.gov/wz/technologies/albuquerque/index.htm>
- Work Zone Travel Time System (FHWA-HOP-04-032)—Adobe Acrobat format: <http://www.ops.fhwa.dot.gov/wz/technologies/arizona/arizona.pdf>
- Work Zone Travel Time System—HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14001.htm, EDL# 14001 or <http://www.ops.fhwa.dot.gov/wz/technologies/arizona/index.htm>
- Dynamic Lane Merge System (FHWA-HOP-04-033)—Adobe Acrobat format: <http://www.ops.fhwa.dot.gov/wz/technologies/michigan/michigan.pdf>
- Dynamic Lane Merge System—HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/14011.htm, EDL# 14011 or <http://www.ops.fhwa.dot.gov/wz/technologies/michigan/index.htm>
- Real-Time Work Zone Traffic Control System (FHWA-HOP-04-018)—Adobe Acrobat format:
<http://www.ops.fhwa.dot.gov/wz/technologies/springfield/springfield.pdf>
- Real-Time Work Zone Traffic Control System—HyperText Markup Language format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13984.htm, EDL# 13984 or
<http://ops.fhwa.dot.gov/wz/technologies/springfield/index.htm>



Incorporating Intelligent Transportation Systems into Planning Analysis: Summary of Key Findings from a Seattle 2020 Case Study (FHWA-OP-02-031) (2002)

This report presents a new transportation modeling technique that shows how ITS can improve the reliability of the transportation infrastructure. This new technique is especially useful because traditional analytical tools often fail to capture how transportation improvements perform under a wide range of conditions.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13605/13605.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13605.html, EDL# 13605



Intelligent Transportation Systems in Work Zones: A Cross-Cutting Study (FHWA-OP-02-025) (2002)

This report is one in a series designed to educate public sector managers about particular ITS technologies. This report examines how transportation departments in Illinois, Michigan, New Mexico, and Arkansas used ITS in their work zones and recounts the benefits they experienced. The report also profiles other ITS-related work zone products, systems, and techniques.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://ops.fhwa.dot.gov/wz/docs/ITSWorkzones.pdf> or http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13600_files/13600.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13600.html, EDL#14128



Metropolitan ITS Integration: A Cross-Cutting Study (FHWA-OP-02-083/FTA-TRI-11-02-05) (2002)

This report, one in a series designed to educate public sector managers about particular ITS technologies, profiles how 24 cities in the U.S. have achieved integration of previously disparate ITS systems, the benefits they have gained as a result, and the lessons they have learned. The report concludes with a series of successful practices for making ITS integration a reality, in the areas of planning, design, implementation, and operations and maintenance.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13672_files/13672.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13672.html, EDL# 13672



Using Metropolitan ITS Deployment Tracking for Regional ITS Planning: Telling the Deployment Story in Tucson, Arizona (FHWA-OP-02-035) (2002)

This case study examines how the Pima Association of Governments (PAG) used the methodology contained in the Metropolitan ITS Deployment Tracking Database to develop its ITS Strategy Deployment Plan. Using the methodology contained in the database allows agencies to compare their current ITS assets with what is possible (the “could” case), as well as with the region’s long-term goals (the “should” case).

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13606_files/13606.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13606.html, EDL# 13606



Deploying and Operating Integrated Intelligent Transportation Systems: Twenty Questions and Answers (FHWA-OP-02-023) (2001)

This report summarizes lessons learned through evaluation of the four Metropolitan Model Deployment Initiative (MMDI) sites selected in 1996: San Antonio, Texas; Phoenix, Arizona; Seattle, Washington; and the New York/New Jersey/Connecticut area. One of the goals of the MMDI was to demonstrate measurable benefits resulting from the application of integration, region-wide approaches to transportation management, and provision of traveler information. This report synthesizes the evaluations that were conducted at the selected sites, and includes findings from follow-up interviews conducted with site managers in the spring of 2001—five years after the start of the program. This report is intended to assist traffic managers, planners, and other key decision-makers in metropolitan areas that are considering similar integrated ITS applications.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13599/13599.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13599.html, EDL# 13599



Informed Motorists, Fewer Crashes—Using Intelligent Transportation Systems in Work Zones (FHWA-OP-01-043) (2001)

This brochure, one in a series designed to encourage decision-makers to invest their own budget resources in ITS, examines the safety and mobility benefits of the use of ITS in work zones. The brochure quotes elected officials and transportation professionals from around the country about the benefits they have experienced from using ITS in work zones.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13584/13584.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13584.html, EDL# 13584



San Antonio's Medical Center Corridor: Lessons Learned from the Metropolitan Model Deployment Initiative (FHWA-OP-01-034) (2001)

This is one in a series that documents lessons learned from the Metropolitan Model Deployment Initiative (MMDI). This report documents the benefits of integration of traffic management on both freeways and arterial streets.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13220.pdf.



Ventura County Fare Integration: A Case Study (FHWA-OP-01-033/FTA-TRI-11-01-01) (2001)

This report is one in a series designed to educate public sector managers about particular ITS technologies. Starting in 1996, transit agencies in Ventura County, California, field-tested an electronic fare payment system called "Smart Passport." The demonstration ended in 1999 without Ventura County transit operators experiencing many of the program's anticipated benefits. The demonstration was conducted when the National ITS Program was in its early stages and few resources were available to assist the local participants. Today, the experiences of Ventura County have much to teach us. This case study contains insights gained in institutional needs, technical requirements, and customer acceptance techniques that can be helpful to those deploying any new technology in an operational setting.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13479/13479.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13479.html, EDL# 13479



What Have We Learned about Intelligent Transportation Systems? (FHWA-OP-01-006) (2000)

In this compendium report, a distinguished set of authors looks back on the 10 years of the National ITS Program to examine which ITS technology applications have been successful, which have not been successful, and what are the underlying factors that determine success versus failure. Individual chapters focus on freeway, incident, and emergency management and electronic toll collection; arterial management; advanced traveler information systems; advanced public transportation systems; commercial vehicle operations; cross-cutting technical and programmatic issues; and institutional issues. An introductory chapter provides a synthesis of lessons learned, and a closing chapter looks toward the future to offer final comments. An appendix reprints tables from each chapter that summarize the state of deployment of ITS technologies.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13316.pdf, EDL# 13316. To order a hardcopy, contact the Operations/ITS HelpLine, (866) 367-7487 or itspubs@dot.gov.



Evaluation 101: Training Session on ITS Performance Measures and Evaluation Techniques

This series of PowerPoint slides comprises the handouts that were distributed at a training course on ITS performance measures and evaluation techniques that was presented in conjunction with the 10th ITS World Congress in Madrid, Spain in November 2003.

The course provides an overview of ITS project evaluation methods commonly used in both the U.S. and Europe, showing the similarities and differences between these two methods. Recommended steps include forming an evaluation team, developing an evaluation strategy, developing an evaluation plan and test plans, data collection and analysis, and reporting of results. The course stresses that these steps are not strictly sequential, but also cyclical, so that evaluation can give feedback to ITS projects to improve their performance.

Cost: Free

To Access This Resource: Access the website address <http://www.ibec-its.co.uk/?q=Training%20Materials>.



SAFETEA-LU Points-of-Contact

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- Walter Kulyk, FTA Office of Mobility Innovation, (202) 366-4991, Walter.Kulyk@dot.gov



SAFETEA-LU Website

This FHWA's official website for the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), which authorizes the Federal surface transportation programs for highways, highway safety, and transit for the five-year period from 2005 to 2009. The website contains the full text of the legislation, summaries of SAFETEA-LU's content, progress reports, over 50 fact sheets on the programs covered by and provisions of the legislation, and funding tables showing the legislation's authorizations, apportionments, allocations, and obligation limitations. The cross-reference feature links each section of the legislation with related guidance (policy memoranda, Federal Register notices, regulatory actions, etc.), fact sheets, questions and answers, and other resources.

Cost: Free

To Access This Resource: Access the website address <http://www.fhwa.dot.gov/safetealu>.



Surface Transportation Reauthorization Section of the U.S. DOT Website

This website is a repository of information regarding the reauthorization of the Transportation Equity Act for the 21st Century (TEA-21). Using several key reference documents available for downloading, including the full text of the U.S. DOT's Safe, Accountable, Flexible, Efficient Transportation Equity Act (SAFETEA) proposal for TEA-21 reauthorization, this site describes the U.S. DOT's rationale behind its proposal. The site allows

users to post their own comments on reauthorization, as well as view comments made by others. The site also contains a list of frequently asked questions (with answers), testimony provided at previous Congressional hearings, and related links.

Cost: Free

To Access This Resource: Access the website address <http://www.fhwa.dot.gov/reauthorization>.

<http://>

TEA-21 Section of the FHWA Website

This website is a comprehensive compilation of resources related to the Transportation Equity Act for the 21st Century (TEA-21). The “Legislation” section contains the full text of TEA-21, the TEA-21 Restoration Act, and related Congressional reports. The ITS portion of TEA-21 is under Title V, Subtitle C. The “Cross Reference” section contains the legislative language, links to related guidance (policy memoranda, *Federal Register* notices, regulatory actions, etc.), fact sheets, and frequently asked questions (with answers) for each section of TEA-21. The “Summary Information” section contains summaries of the TEA-21 legislation and progress reports. The “Fact Sheets” section contains fact sheets on the programs and provisions of TEA-21. The fact sheet on ITS is available at <http://www.fhwa.dot.gov/tea21/factsheets/its.htm>. The “Funding Tables” section contains tables showing TEA-21 authorization amounts, apportionments, allocations, and obligation limitations. The “Information Exchange” section provides a schedule of the outreach sessions conducted in 1998, summaries of each session, and a report that synthesizes findings from all the sessions. The “Publications” section links to TEA-21-related publications and instructions for ordering copies. Two ITS-related publications are available: *Intelligent Transportation Systems in the Transportation Equity Act for the 21st Century* and *The TEA-21 ITS Deployment Program: Interim Report 2000*.

Cost: Free

To Access This Resource: Access the website address <http://www.fhwa.dot.gov/tea21>.



Intelligent Transportation Systems in the Transportation Equity Act for the 21st Century (FHWA-JPO-99-040) (1999)

This brochure highlights the key provisions in the ITS section of the Transportation Equity Act for the 21st Century (TEA-21), the U.S. DOT's approach to developing these policies, and how state, local, and private stakeholders can participate in the policy development process. Topics covered include the ITS Deployment section of TEA-21 (including the ITS Integration Program and the Commercial Vehicle ITS Infrastructure Program), research and development, Federal-aid funding sources, critical ITS standards, conformity with the National ITS Architecture and Standards, procurement, and the *National ITS Program Plan*.

Cost: Free

To Access This Resource: Access the website address
<http://www.itsdocs.fhwa.dot.gov/jpodocs/brochure/6090.pdf>.



Transportation Equity Act for the 21st Century (1998)

The Transportation Equity Act for the 21st Century (TEA-21) was enacted June 9, 1998, as Public Law 105-178. TEA-21 authorizes the Federal surface transportation programs for highways, highway safety, and transit for the six-year period 1998-2003. TEA-21 builds on the initiatives established in the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), which was the last major authorizing legislation for surface transportation.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://www.fhwa.dot.gov/tea21/pl105178.pdf>
- HyperText Markup Language (HTML) format:
<http://www.fhwa.dot.gov/tea21/h2400.htm>



Standards Development and Implementation Points-of-Contact

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- Ed Fok, FHWA Resource Center, (415) 744-0113, Edward.Fok@dot.gov
- Michael Baltes, FTA Office of Mobility Innovation, (202) 366-2182, Michael.Baltes@dot.gov



ITS Standards Program Section of the ITS Joint Program Office Website

This site is the official website of the ITS Standards Program. The “About the Program” section contains a description of the key program activities and the partners of the program. The “Learn About Standards” section provides background on the program and describes the program’s role in ITS research initiatives. This section also discusses several aspects of standards, including application areas, standards’ life cycles, standards development, standards testing, and the system engineering process. The “Deployment Resources” section lists available technical assistance, training programs, testing programs, publications, and discussion forums. The “Development Activities” section provides an overview of the standards development process, including how future standards candidates are identified. This section also provides the status of over 100 ITS standards currently in development.

Cost: Free

To Access This Resource: Access the website address <http://www.standards.its.dot.gov/default.asp>.

http://

National Transportation Communications Protocols for ITS (NTCIP) Website

This website is a compilation of resources related to the National Transportation Communications for ITS Protocols (NTCIP) family of standards. The “Background” section contains a basic description of NTCIP, its function and history. The “Deployment” section contains a list of NTCIP projects by location, *The NTCIP Guide*, and case studies on the use of NTCIP. There is also a link for ordering NTCIP standards from the National Electronics Manufacturers Association (NEMA) and the Institute of Transportation Engineers (ITE). The “Library” section contains a collection of documents, software products, and links relating to NTCIP, including draft standards and NTCIP operational and deployment documents. Newly approved standards are available for download from the “Library” section for free up through one year after their approval, under a program funded by the ITS Joint Program Office. The “News” section contains current and updated information concerning NTCIP. The NTCIP newsletter can be downloaded from this section of the website. The “Calendar” section contains a list of upcoming events. The “Committees” section is where users can go to log in to restricted work areas of the website.

Cost: Free

To Access This Resource: Access the website address <http://www.ntcip.org>.

http://

Advanced Transportation Controller (ATC) Specifications Website

This website is a compilation of resources related to Advanced Transportation Controller (ATC) specifications. ATC specifications define a general purpose field computer that is intended for continuous, unattended operation in harsh environments. The specifications define interchangeable modules that are combined to form a Type 2070 ATC capable of running control software from various vendors. In many cases, the specifications define several module options that can be arranged in a variety of configurations to meet users’ needs. The website provides an

overview of ATC specifications and its application program interface (API), as well as reference documents pertaining to those standards.

Cost: Free

To Access This Resource: Access the website address

<http://www.ite.org/standards/atc>.



ITS Standards Field Support Team

The ITS Standards Field Support Team (SFST) provides short-term, on-call, technical assistance to support the adoption and use of ITS standards. The Team is comprised of FHWA technical staff. Services offered by the Team include: assessment of a user's current ITS system to identify where standards may be beneficial; assistance in the development of project specifications; review of existing contracts and specifications; assistance in the identification of appropriate contracting mechanisms; assistance in the development of test plans; and evaluation of systems for compliance with contracts and conformance to specifications. Services are available to public sector staff at the Federal, state, and local levels.

Cost: Free

To Access This Resource: Contact the ITS Specialist at the FHWA Division Office in your state. Contact information for these individuals can be found online at

http://www.ops.fhwa.dot.gov/int_its_deployment/its_specialists/fhwa_office.htm. Alternatively, contact Ed Fok, FHWA Resource Center, (415) 744-0113, Edward.Fok@dot.gov.



ITS Standards Database

This database contains the over 100 ITS standards being tracked by the ITS Standards Program. Users can search the database by lead standard development organization (SDO), development status, or keyword. Each record contains the standard's title, a description, current status, informational website, and point of contact with telephone number and e-mail address.

Cost: Free

To Access This Resource: Access the website address

<http://www.standards.its.dot.gov/stdssearch.asp>.



Application Area Table

This table is a guide to ITS standards documentation that should be considered for use in different types of ITS projects. Each row in the table represents an Interface Class from the National ITS Architecture. The National ITS Architecture's 19 application areas are listed in the second column of the table.

Cost: Free

To Access This Resource: Access the website address http://www.standards.its.dot.gov/learn_Application.asp.



Center-to-Field (C2F) Communications Profiles Standards Advisory (2007)

This flier is one of a series of documents that provide state and local transportation agencies with background and guidance on development issues and other key activities related to ITS standards. Center-to-Field (C2F) communications take place between a traffic management center (TMC) and one or more field devices managed by that center. C2F communications cover lower layer interfaces between a TMC and such devices as dynamic message signs (DMSs), traffic signals, ramp meters, environmental sensor stations (ESSs), closed-circuit television (CCTV) cameras and data collection devices. C2F standards can be divided into two categories: (1) message and data content and (2) rules for exchanging messages and data. The focus of this ITS Standards Advisory is on the rules for exchanging messages and data, called "C2F communications profile standards." The flier contains a list of C2F communications profile standards, a list of C2F resources, and a list of C2F documents and guides.

Cost: Free

To Access This Resource: Access the website address http://www.standards.its.dot.gov/Documents/advisories/adv_c2f_bg.asp.



Center-to-Center (C2C) Communications Profiles Standards Advisory (2006)

This flier is one of a series of documents that provide state and local transportation agencies with background and guidance on development issues and other key activities related to ITS standards. Center-to-Center (C2C) communications relate to all aspects of ITS, covering the exchange of data between computers physically located in different transportation management facilities (e.g., traffic management centers, transit management centers, emergency management centers, and parking management centers.) C2C standards enable exchange of data, specifying what information is exchanged, how and when it is exchanged, and the underlying transport mechanisms. C2C standards can be divided into two categories: (1) message and data content and (2) rules for exchanging messages and data. The focus of this ITS standards advisory is on the rules for exchanging messages and data, called “C2C communications profile standards.” The flier contains a list of C2C communications profile standards, a list of C2C standards resources, and a list of C2C documents and guides.

Cost: Free

To Access This Resource: Access the website address:
http://www.standards.its.dot.gov/Documents/advisories/adv_c2c_bg.asp.



Incident Management (IM) ITS Standards Advisory (2004)

This flier is one of a series of documents that provide state and local transportation agencies with background and guidance on development issues and other key activities related to ITS standards. This flier describes the family of standards developed by the Institute of Electrical and Electronics Engineers (IEEE) that facilitates incident management. The IEEE 1512 family allows traffic management systems and public safety management systems to exchange incident-related information immediately for real-time command and control of resources. The flier profiles each of the four standards in the family (the base standard and standards for traffic incident management, public safety, and

hazardous materials), and provides an update on their standards development status. The flier contains case studies on the use of IEEE 1512 standards in New York, Washington, D.C., Utah, and Washington State; and a list of available resources for technical assistance.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.standards.its.dot.gov/Documents/advisories/IM_advisory.pdf
- HyperText Markup Language (HTML) format: http://www.standards.its.dot.gov/Documents/advisories/IM_Advisory.htm



National Transportation Communications for ITS Protocol (NTCIP) Case Study Reports (1999-2004)

This series of documents describes the lessons learned by vendors, agencies, and consultants during a project that required compliance with the National Transportation Communications for ITS Protocol (NTCIP).

Cost: Free

To Access This Resource: Access the following website addresses:

- NTCIP 9002 v01.04: Virginia DOT Statewide VMS Project (1999): http://www.ntcip.org/library/documents/pdf/9002_090999.pdf
- NTCIP 9003 v01.04: Washington State DOT NTCIP VMS Software Upgrade (1999): http://www.ntcip.org/library/documents/pdf/9003_090999.pdf
- NTCIP 9004 v01.05: City of Phoenix, Arizona—Phoenix Advanced Transportation Management System (1999): http://www.ntcip.org/library/documents/pdf/9004_090999.pdf
- NTCIP 9005 v01.09: Texas Department of Transportation Statewide Center-to-Center Software and Systems Integration (2004): http://www.ntcip.org/library/documents/pdf/9005v0109a_txdot_c2c.pdf
- NTCIP 9006 v01.06: City of Lakewood, Colorado—Lakewood Advanced Traffic Management System (2004): http://www.ntcip.org/library/documents/pdf/9006v0106_lakewood.pdf

- NTCIP 9007 v01.05: City of Mesa Arizona Signal System Upgrade (2004): http://www.ntcip.org/library/documents/pdf/9007v0105_mesa.pdf
- NTCIP 9008 v01.06: Minnesota DOT Statewide R/WIS Project (2004): <http://www.ntcip.org/library/documents/pdf/9008v01-06.pdf>
- NTCIP 9009 v01.05: Washington State Department of Transportation Statewide ESS Procurement (2004): <http://www.ntcip.org/library/documents/pdf/9009v01-05.pdf>



Archived Data User Service (ADUS) ITS Standards Advisory (2003)

This flier is one of a series of documents that provide state and local transportation agencies with background and guidance on development issues and other key activities related to ITS standards. This flier describes the first ITS standard to be published related to the archived data user service (ADUS): ASTM E2259-03 *Standard Guide for Archiving and Retrieving ITS-Generated Data* issued by the American Society for Testing and Materials (ASTM). The flier contains case studies on the use of ASTM E2259-03 in Alaska, Arizona, Maryland, and Virginia; a list of contacts; and a bibliography.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.standards.its.dot.gov/Documents/advisories/adus_advisory.pdf
- HyperText Markup Language (HTML) format: http://www.standards.its.dot.gov/Documents/advisories/ADUS_Advisory.htm



Dedicated Short Range Communications (DSRC) ITS Standards Advisory (2003)

This flier is one of a series of documents that provide state and local transportation agencies with background and guidance on development issues and other key activities related to ITS standards. This flier provides an update on recent developments concerning the set of standards that implement high speed

Dedicated Short Range Communications (DSRC) vehicle to vehicle and between vehicles and the roadside. In 1999, the Federal Communications Commission (FCC) allocated the 5.9 GHz band of frequency for DSRC. Since that time, the American Society of Testing and Materials (ASTM) has been developing standards to implement DSRC and approved the first DSRC standard E2213-02 in 2002. The flier contains a case study on the use of ASTM E2259-03 in Michigan, a list of contacts, and a bibliography.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.standards.its.dot.gov/Documents/advisories/dsrc_advisory.pdf
- HyperText Markup Language (HTML) format: http://www.standards.its.dot.gov/Documents/advisories/dsrc_advisory.htm



Dynamic Message Signs (DMS) ITS Standards Advisory (2003)

This flier is one of a series of documents that provide state and local transportation agencies with background and guidance on development issues and other key activities related to ITS standards. This flier provides an update on recent developments concerning standards for dynamic message signs within the National Transportation Communications for ITS Protocol (NTCIP) family of ITS standards. An initial version of the NTCIP standard for dynamic message signs—NTCIP 1203—was published in 1997 and a second version is under development. The flier contains case studies on the use of NTCIP 1203 in Illinois and Virginia, a list of contacts, and a bibliography.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.standards.its.dot.gov/Documents/advisories/dms_advisory.pdf
- HyperText Markup Language (HTML) format: http://www.standards.its.dot.gov/Documents/advisories/dms_advisory.htm



Environmental Sensor Stations (ESS) ITS Standards Advisory (2003)

This flier is one of a series of documents that provide state and local transportation agencies with background and guidance on development issues and other key activities related to ITS standards. This flier provides an update on recent developments concerning standards for environmental sensor stations within the National Transportation Communications for ITS Protocol (NTCIP) family of ITS standards. An initial version of the NTCIP standard for environmental sensor stations—NTCIP 1204—was published in 1998. The flier contains case studies on the use of NTCIP 1204 in Minnesota, Washington, and Wisconsin; a list of contacts; and a bibliography.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://www.standards.its.dot.gov/Documents/advisories/ess_advisory.pdf
- HyperText Markup Language (HTML) format: http://www.standards.its.dot.gov/Documents/advisories/ess_advisory.htm



The NTCIP Guide (2002)

The subject of communications protocols and standards is a challenging one, even for engineers experienced in these issues. In the case of the National Transportation Communications for ITS Protocol (NTCIP), the level of difficulty is heightened by the fact that NTCIP is a whole suite of documents and protocols aimed at meeting the communications needs of the various fixed-point communications components of the National ITS Architecture, not just one single component. The purpose of this guide is to assist decision-makers, planners, specification writers, and implementers to understand the various NTCIP standards documents and how to use them, as well as the overall motivations behind the use of NTCIP. The document has been updated twice since its publication in 1999. The most recent version is *NTCIP 9001 v.03.02*, which was accepted by the Joint Committee on the NTCIP in October 2002.

Cost: Free

To Access This Resource: For the most recent version of the document, access the website address <http://www.ntcip.org/library/guide.asp>.



Specification Guide for Procurement of NTCIP-Compliant Dynamic Message Signs (DMS) (2002)

This document provides guidance on how to procure dynamic message signs that are compliant with the National Transportation Communications for ITS Protocol (NTCIP) 1203 Dynamic Message Signs v1 standard. The guide contains an overview of the NTCIP standard, an explanation of the need to include particular information when developing an NTCIP specification for dynamic message signs, a suggested outline for procurement specifications, and sample text for inclusion in the specifications.

Cost: Free

To Access This Resource: Access the website address <http://www.standards.its.dot.gov/Documents/genDMSSpec.pdf>.



ITS Standards Lessons Learned Reports: Raising ITS Standards IQ (2000-2001)

This series of two brochures documents lessons learned on how to raise awareness and understanding of ITS standards among transportation stakeholders, particularly those in the public sector. Lesson Learned Report #1 discusses how the Minnesota Department of Transportation (Mn/DOT) heightened awareness of ITS standards by hosting a one-day workshop among public sector representatives at the state, county, and city levels. Lesson Learned Report #2 describes the experiences of nine state transportation agencies who were among the first to use dynamic message signs (DMSs) built to specifications contained in the National Transportation Communications for ITS Protocol (NTCIP).

Cost: Free

To Access This Resource: Access the following website addresses:

- Lessons Learned Report #1: Raising ITS Standards IQ with a Public Sector Workshop (FHWA-OP-00-010) (2000)—Adobe Acrobat format: <http://www.standards.its.dot.gov/Documents/lessons1.pdf>
- Lessons Learned Report #1: Raising ITS Standards IQ with a Public Sector Workshop—HyperText Markup Language (HTML) format: <http://www.standards.its.dot.gov/Documents/lessons1/its1.htm>
- Learned Report #2: Raising ITS Standards IQ with Implementation of NTCIP-Based Dynamic Message Signs (FHWA-OP-01-032) (2001)—Adobe Acrobat format: <http://www.standards.its.dot.gov/Documents/lessons2.pdf>
- Learned Report #2: Raising ITS Standards IQ with Implementation of NTCIP-Based Dynamic Message Signs—HyperText Markup Language format: <http://www.standards.its.dot.gov/Documents/lessons2/its2.htm>



Intelligent Transportation Systems: Critical Standards (1999)

This report fulfills a requirement of the Transportation Equity Act for the 21st Century (TEA-21) to identify by June 1, 1999 “which standards are critical to ensuring national interoperability or critical to the development of other standards and specifying the status of development of each standard identified.” The report provides a definition of “critical,” describes the process and criteria for choosing the critical standards, and notes what considerations were taken in applying these criteria.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_pr/5515.pdf, EDL# 5515.



DMS Procurement Workshop

This workshop discusses the nuts and bolts of a successful dynamic message sign (DMS) procurement. Participants will learn to develop methods for incorporating National Transportation Communications for ITS Protocol (NTCIP) standards into their DMS specifications. The workshop gives participants practical, ready-to-use information on a full range of topics related to the procurement of standards-based DMS systems. Target Audience: Public and private sector professionals responsible for specifying and procuring ITS-related equipment and services. Transportation/ITS engineers, project managers, technical team members (specification writers), consultants, contractors, and operators will all benefit from the workshop. Course Length: Two days.

Cost: Free

To Access This Resource: Access the website address http://www.ops.fhwa.dot.gov/int_its_deployment/standards_imp/dmswkshp.htm or contact Tom Stout, FHWA Office of Transportation Management, (202) 366-6054, Tom.Stout@dot.gov.



ITS Standards Training Courses

This series of four courses focuses on the use of ITS standards in deploying four particular types of ITS technologies: dynamic message signs (DMSs), ITS centers (using the center-to-center [C2C] communication), actuated traffic signals/advanced transportation controllers (ATS/ATC), and traffic incident management (using the Institute for Electrical and Electronics Engineers [IEEE] 1512 family of standards.) Skill Level: Specialized learning. Target Audience: Public and private sector transportation professionals responsible for or involved in specifying or procuring ITS-related equipment, and transportation policymakers interested in maximizing the utility of ITS systems.

Cost: Free

To Access This Resource: Access the website address http://www.pcb.its.dot.gov/le_search.asp?SearchRequested=True&PageID=res_curric&ProviderID=2.



Systems Engineering Points-of-Contact

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- Mac Lister, FHWA Resource Center, (708) 283-3532, Mac.Lister@dot.gov
- Steven Mortensen, FTA Office of Mobility Innovation, (202) 493-0459, Steven.Mortensen@dot.gov

http://

Systems Engineering Section of the FHWA Office of Operations Website

FHWA's Final Rule and FTA's Policy on ITS Architecture and Standards requires a systems engineering analysis for all ITS projects using Federal funds. This website contains a compilation of resources to help Federal fund recipients conduct the required systems engineering analysis, including training courses and reference publications.

Cost: Free

To Access This Resource: Access the website address http://www.ops.fhwa.dot.gov/int_its_deployment/sys_eng.htm.

http://

Systems Engineering for ITS Guidebook Website

This website, co-sponsored by FHWA and the California Department of Transportation, presents the document *Systems Engineering Guidebook for ITS* in five different interactive formats. The Process View shows the many different processes that comprise the systems engineering (SE) process, graphically represented in a "V" diagram. The Deliverable View shows 11 different types of documents—plans, assessments, and specifications—that need to be developed in order to follow the SE process. The

Project View provides case studies on how the SE process can be applied to specific ITS projects. Both hypothetical and real-world case studies from California, Maryland, and New York are provided. The Role View shows what role three different types of stakeholders—system owners, systems engineering assistants, and development team members—play in the SE process. The Document View is a section-by-section presentation of the *Systems Engineering Guidebook for ITS*, which is also available in Adobe Acrobat format from this site.

Cost: Free

To Access This Resource: Access the website address <http://www.fhwa.dot.gov/cadiv/segb>.



Systems Engineering for Intelligent Transportation Systems: An Introduction for Transportation Professionals (FHWA-HOP-07-069) (2007)

This handbook is an introduction to systems engineering, showing how the systems engineering (SE) process can be applied to planning, designing, and implementing ITS projects. This handbook leads the reader, step by step, through the project life cycle and discusses how SE can be applied at each step. The handbook explains how to begin implementing the SE approach on new projects and how to incorporate SE more broadly into an organization's business processes and practices. The handbook concludes with a list of resources, including ITS-specific publications, general SE references, selected SE standards, and available SE training.

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: <http://www.ops.fhwa.dot.gov/publications/seitsguide/seitsguide.pdf>
- HyperText Markup Language (HTML) format: <http://www.ops.fhwa.dot.gov/publications/seitsguide/index.htm>



Systems Engineering Guidebook for ITS: Version 2.0 (2007)

This document presents a step-by-step guide to the systems engineering (SE) process. The guidebook discusses what the systems engineering process is, how it works, and the benefits of using it. The guidebook also lists component processes that make up the overall SE process and explores the many factors that drive the systems engineering environment, including the National ITS Architecture, transportation planning, information technology, and ITS standards. The guidebook presents case studies on how to apply the SE process to specific projects. Both hypothetical and real-world examines from Maryland and New York are presented. The guidebook discusses roles that three different types of stakeholders—system owners, systems engineering assistants, and development team members—play in the SE process. The guidebook concludes with a discussion of the Capability Maturity Model Integration (CMMI) tool, originally developed for software development, and how it can be applied to ITS projects. Version 1.1 of the guidebook was published in 2005. The current version—Version 2.0—was published in 2007 with updated material, a restructured organizational scheme, real-world case studies, and an interactive online format:

<http://www.fhwa.dot.gov/cadiv/segb>.

Cost: Free

To Access This Resource: Access the website address
<http://www.fhwa.dot.gov/cadiv/segb/files/segbversion2.pdf>.



Configuration Management for Transportation Management Systems: Final Report (FHWA-OP-04-013) (2003)

This handbook provides an introduction to configuration management (CM) in a transportation context. The handbook defines configuration management, describes current CM practices, and discusses CM processes and plans. The handbook provides guidance on how to establish a formal CM program and concludes with a list of CM resources and tools. Development of this handbook was sponsored by the Transportation Management Center Pooled-Fund Study (TMC PFS).

Cost: Free

To Access This Resource: Access the following website addresses:

- Adobe Acrobat format: http://tmcpsfops.fhwa.dot.gov/cfprojects/uploaded_files/CM%20for%20TMS%20Handbook%20v3.pdf
- HyperText Markup Language (HTML) format: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13885.html, EDL# 13885



Systems Engineering CD-ROM (2002)

This CD-ROM contains three documents that introduce various aspects of systems engineering to transportation professionals. One report provides a general overview of the systems engineering process. A second report explores how to develop functional requirements for ITS projects. A third report introduces the topic of configuration management (CM) and explores how CM can be used in deploying ITS.

Cost: Free

To Access This Resource: To order a copy of the CD-ROM, contact the Operations/ITS HelpLine, (866) 367-7487, itspubs@dot.gov or access the following website addresses:

- Building Quality Intelligent Transportation Systems through Systems Engineering (FHWA-OP-02-046): http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13620.html, EDL# 13620
- Developing Functional Requirements for ITS Projects (FHWA-OP-02-047): http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13621.html, EDL# 13621
- A Guide to Configuration Management for Intelligent Transportation Systems (FHWA-OP-02-048): http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13622.html, EDL# 13622



Configuration Management in Transportation Management Systems (NCHRP Synthesis# 294) (2001)

This synthesis report defines how configuration management (CM) is currently being developed and used by transportation management personnel. This report addresses the fundamental concepts and principles of CM, the need for CM within transportation management systems, and available CM resources such as documents, standards, websites, and software tools. The report also explores how configuration management is being used within transportation departments, and contains detailed case studies on CM both within and outside of the transportation field.

Cost: \$23

To Access This Resource: Contact the Transportation Research Board (TRB) Bookstore at <http://www.trb.org/bookstore> and search for "SYH294," (202) 334-3213, fax: (202) 334-2519.



Introduction to Systems Engineering for Advanced Transportation (NHI Course# 137024)

This course provides an introduction to systems engineering for ITS project managers and staff, allowing participants to understand the benefits of applying systems engineering approaches to developing quality systems. The course covers both technical practices (modeling, prototyping, trade-off analysis, and testing) and management practices (risk analysis and mitigation). Skill Level: Core learning. Target Audience: Transportation engineers and other information technology (IT) professionals and technical staff at all levels of the public and private sectors, including ITS project managers, technical team members, contractors, and staff. Project managers in particular may benefit from this course. This course is available in classroom, Web-based and blended instructor-led/Web-based versions. Course Length: Two days for the classroom version; 10 hours for the Web-based and blended versions.

Cost: \$300 per participant for the classroom version; \$175 per participant for the Web-based version; \$250 per participant for the blended version.

To Access This Resource:

- For the classroom version, access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number “137024.”
- For the Web-based and blended versions, access the website address <http://www.citeconsortium.org/courses/SE101.html> or contact Kathleen Frankle, Consortium of ITS Training and Education (CITE), (410) 414-2925, KFrankle@umd.edu.



Managing High Technology Projects in Transportation (NHI Course# 137026)

The goal of this course is to improve the project management skills of both public and private sector personnel responsible for managing the implementation of technology-intensive transportation projects. The course provides training on the fundamental principles and practices of good project management; the steps to be taken for planning, design, and implementation of transportation systems projects; the types of project management tools available; and the basic skills required to be a good project manager. Skill Level: Core learning. Target Audience: Current and prospective project managers from state and local transportation agencies, as well as those in the private sector who support the implementation of advanced transportation projects. Course Length: Two days. This course is available in classroom, Web-based and blended instructor-led/ Web-based versions. Course Length: Two days for the classroom version; eight hours for the Web-based and blended versions.

Cost: \$300 per participant for the classroom version; \$200 per participant for the Web-based version; \$250 per participant for the blended version.

To Access This Resource:

- For the classroom version, access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number “137026.”

- For the Web-based and blended versions, access the website address <http://www.citeconsortium.org/courses/2mod11.html> or contact Kathleen Frankle, Consortium of ITS Training and Education (CITE), (410) 414-2925, KFrankle@umd.edu.



Configuration Management (CM) for Traffic Management Systems (NHI Course# 137042)

Configuration management (CM) is the practice of handling changes systematically so that a facility maintains its integrity over time. CM involves policies, procedures, techniques, and tools to manage and evaluate proposed project changes, track the status of changes, and maintain an inventory of system and support documents. This course presents issues surrounding CM and recommended practices for agencies to consider in a modular manner. A two-day version of the course presents all 10 modules. The sponsor may select modules to be presented in the one-day version of the course. Target Audience: Any individual involved in the planning, design, implementation, management, operation, or maintenance of transportation systems, including representatives of metropolitan planning organizations, traffic management centers, state and local governments, FHWA, universities, and consultants. Course Length: Two days.

Cost: \$300 per participant

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137042."



Advanced Systems Engineering for Advanced Transportation Projects

This Web-based distance-learning course covers a broad set of topics in systems engineering and systems integration. The course provides participants with an appreciation of the principles of systems engineering and its application to ITS projects. In addition, this course introduces participants to techniques of systems integration associated with regional systems. Introduction to Systems Engineering is recommended, but not required, before

taking this course. Skill Level: Specialized learning. Target Audience: Transportation engineering and information technology (IT) professionals involved in the implementation of ITS, plus graduate students pursuing a concentration in ITS. A blended Web-based version provides online interaction between participants and instructors. Course Length: 10 hours.

Cost: \$200 per participant for the Web-based version; \$250 per participant for the blended version.

To Access This Resource: Access the website address <http://www.citeconsortium.org/courses/syseng.html> or contact Kathleen Frankle, Consortium of ITS Training and Education (CITE), (410) 414-2925, KFrankle@umd.edu.



Approaches for Integrating Systems Engineering into Your Agency's Business Practices

The course explains how systems engineering (SE) can be applied to an organization's day-to-day business processes and practices. Case studies from state departments of transportation (DOTs) in Mississippi and Virginia show the approach these agencies used to incorporate SE into the project delivery process. The case studies also explain how needed institutional changes occurred and what products had to be developed in support of the SE application. This interactive Web-based training course ("webinar"), offered August 2, 2007, has been archived in several formats: the MS PowerPoint presentations given, transcripts that include the question and answer period, and an audio recording with simultaneous text captioning.

Cost: Free

To Access This Resource: Access the following website addresses:

- Transcript in HyperText Markup Language (HTML) format (Part 1—FHWA presentation): http://www.pcb.its.dot.gov/t3/s070802/s070802_lopezpresentation.asp
- Transcript in HyperText Markup Language (HTML) format (Part 2—Mississippi DOT presentation): http://www.pcb.its.dot.gov/t3/s070802/s070802_stokespresentation.asp

- Transcript in HyperText Markup Language (HTML) format (Part 3—Virginia DOT presentation): http://www.pcb.its.dot.gov/t3/s070802/s070802_mcelwainpresentation.asp
- Transcript in HyperText Markup Language (HTML) format (Part 4—Question and answer period): http://www.pcb.its.dot.gov/t3/s070802/s070802_systemsengin_qa.asp
- Audio recording using Macromedia® Flash®: http://www.pcb.its.dot.gov/t3/s070802/T3_070802.html



ITS Systems Engineering (SE) for ITS: Using FHWA's New SE Handbook

This course presents an overview of FHWA's systems engineering (SE) handbook *Systems Engineering for Intelligent Transportation Systems: An Introduction for Transportation Professionals*. The course explains the benefits of SE and in what situations is SE most beneficial. The course shows how to use the handbook and explores steps in the SE process as depicted in a "V" diagram. This interactive Web-based training course ("webinar"), offered March 13, 2007, has been archived in several formats: the MS PowerPoint presentation given, a transcript and an audio recording with simultaneous text captioning.

Cost: Free

To Access This Resource: Access the following website addresses:

- MS PowerPoint Presentation: http://www.pcb.its.dot.gov/T3/s070313/s070313_guide_a.ppt
- Transcript in HyperText Markup Language (HTML): http://www.pcb.its.dot.gov/T3/s070313/s070313_guide_a.asp
- Audio recording using Macromedia® Flash®: http://www.pcb.its.dot.gov/T3/s070313/s070313_guide_cap.html



Telecommunications Points-of-Contact

- Linda Dodge, ITS Joint Program Office, (202) 366-8034, Linda.Dodge@dot.gov
- Jim Arnold, FHWA Office of Research, Development and Technology, (202) 493-3265, James.A.Arnold@dot.gov
- Ed Fok, FHWA Resource Center, (415) 744-0113, Edward.Fok@dot.gov
- Emiliano Lopez, FHWA Office of Transportation Management, (202) 366-2199, Emiliano.Lopez@dot.gov
- Paul Olson, FHWA Resource Center, (720) 963-3239, Paul.Olson@dot.gov
- Raj Wagley, FTA Office of Mobility Innovation, (202) 366-5386, Raj.Wagley@dot.gov
- Laurie Flaherty, NHTSA Office of Emergency Medical Services, (202) 366-2705, Laurie.Flaherty@dot.gov



Telecommunications Section of the ITS Joint Program Office Website

This website is a compilation of resources related to the ITS telecommunications. A memo from FHWA's Executive Director and background discussion paper provide guidance on longitudinal telecommunications installations on limited access highway rights-of-way. A supplemental Notice of Proposed Rule Making (NPRM) on dedicated short-range communication (DSRC) responds to comments filed in the initial NPRM proposing to make a new DSRC specification a requirement for all commercial vehicle operations projects that use Highway Trust Funds. The site also contains frequently asked questions (with answers) on the supplemental NPRM. A white paper discusses how the phenomenal expansion of wireless broadband technology enables consideration of using wireless technology instead of burying cables on transportation rights-of-way. The site contains FHWA's comments on the case that went before the Federal Communications Commission (FCC) on the Minnesota Shared Resources program, plus background material on the Minnesota Department of Transportation's original petition to the FCC. The site also contains several documents concerning the U.S. DOT's petition to the FCC requesting a nationwide three-digit traveler information phone number. (The petition was granted in

2000. The number assigned is 511). The site also lists contacts in the ITS Joint Program Office and related links.

Cost: Free

To Access This Resource: Access the website address <http://www.its.dot.gov/telecom/index.htm>.

[http://](#)

Next Generation 9-1-1 Website

The Next Generation 9-1-1 Initiative aims to enable any communications device used nationwide to connect with the 9-1-1 system. The current 9-1-1 system is built on decades-old technology and cannot receive data from the text, data, image and video devices increasingly common in personal communications and critical in many safety and medical applications. This initiative will involve a fundamental reexamination of the technological approach to 9-1-1 used today. This website presents the goal, background, approach, milestones and points-of-contact for the initiative.

Cost: Free

To Access This Resource: Access the website address <http://www.its.dot.gov/ng911/index.htm>.



Testing and Assessment of J1939 Network Model (FMCSA-PSV-07-003) (2007)

This report documents the findings of a laboratory test of the J1939 communications standard. J1939 is a worldwide standard established by the Society for Automotive Engineers (SAE) for data communication on trucks, buses, off-road construction vehicles and marine vessels. This standard enables multiple software systems to operate on the same vehicle, resolving conflicts in a way that best maintains safety. With innovations in on-board vehicle technology, the number of possible systems using the J1939 standard on a single vehicle continues to increase. A hardware-in-the-loop (HIL) simulator was constructed to test whether the J1939 standard could accommodate the level of data transmission published in the standard. In particular, the study sought to determine whether the addition of non-safety-critical systems would compromise safety-critical systems. The study found that

the standard appears to have 2.5 to 3 times the capacity currently used by the majority of commercial heavy vehicles today. This capacity should allow for the addition of new systems, such as electronic stability control, roll stability control and wireless vehicle inspection systems.

Cost: Free

To Access This Resource: Access the following website addresses:

- Full report: <https://www.fmcsa.dot.gov/facts-research/research-technology/report/Testing-and-Assessment-of-a-Full-Scale-J1939-Network-Model/J1939-Final-Report.pdf>
- Tech Brief (FMCSA-PSV-07-004) (2007)—Adobe Acrobat format: <https://www.fmcsa.dot.gov/facts-research/research-technology/tech/J1939-Network-Testing-march-2007.pdf>
- Tech Brief—HyperText Markup Language (HTML) format: <https://www.fmcsa.dot.gov/facts-research/research-technology/tech/J1939-Network-Testing-march-2007.htm>



Telecommunications Handbook for Transportation Professionals: The Basics of Telecommunications (FHWA-HOP-04-034) (2004)

This handbook provides with basic descriptions of terms and technologies that are commonly used (or considered) in the deployment of freeway management and traffic signal systems, including both voice and data communications. The handbook covers telecommunications fundamentals, the relationship between telecommunications and the National ITS Architecture, a step-by-step process for developing a telecommunications system, field devices, maintenance, warranties, and construction. The handbook also examines the Internet and cutting-edge technologies. Two case studies from Utah and Texas are provided.

Cost: Free

To Access This Resource: Access the website addresses:

- Adobe Acrobat format: http://ops.fhwa.dot.gov/publications/telecomm_handbook/telecomm_handbook.pdf
- HyperText Markup Language (HTML) format: http://ops.fhwa.dot.gov/publications/telecomm_handbook/index.htm



Broadband Wireless, Integrated Services, and Their Application to Intelligent Transportation Systems (2000)

This paper introduces broadband wireless communications alternatives and describes how they can be used to provide high-speed connections between fixed, transportable, and mobile facilities. This paper also introduces integrated service technologies—devices used to bundle voice, data, and video services for transmission over a single broadband wireless link. This paper discusses how these broadband wireless options, when coupled with integrated service technologies, can be used to provide efficient, cost-effective, and flexible multi-service programming, including ITS applications.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13164.pdf, EDL# 13164.



Communications for Intelligent Transportation Systems—Successful Practices: A Cross-Cutting Study (FHWA-JPO-99-023/FTA-TRI-11-99-02) (2000)

This report is one in a series designed to educate public sector managers about particular ITS technologies. Determining what telecommunications network is best suited for one's needs can be an intimidating task for a state or local department of transportation. Agencies require a telecommunications network that enables them to deliver all their desired services to the traveling public, both now and in the future. Furthermore, telecommunications infrastructure can be the single most expensive part of an ITS deployment. This report describes experiences from nine states on what processes work best and what factors they considered when making telecommunications decisions.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/11488.pdf.



What Have We Learned about Intelligent Transportation Systems? Chapter 7: What Have We Learned about Cross-Cutting Technical and Programmatic Issues? (2000)

This document is an excerpt from a compendium report that looks back on the 10 years of the National ITS Program to examine which ITS technology applications have been successful, which have not been successful, and what are the underlying factors that determine success versus failure. This section examines cross-cutting technologies for surveillance and communications, as well as programmatic issues, such as planning and analysis tools, archived data, standards, and architecture.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13323.pdf, EDL# 13323.



DSL for Traffic Video (1999)

This brochure summarizes the results of an assessment of the application of digital subscriber line (DSL or xDSL) technologies to ITS. It provides background on the various types of DSL technologies, describes the concept of xDSL-based traffic video, and explains how a prototype was tested in a laboratory setting and then field-tested in two locations in Northern Virginia. The brochure also contains frequently asked questions (with answers) on implementation of xDSL-based video, testimonial quotes from city traffic engineers who used the system, a list of reference documents, and a list of contacts.

Cost: Free

To Access This Resource: Access the following website addresses:

- Flier (FHWA-OP-99-035): <http://www.itsdocs.fhwa.dot.gov/jpodocs/pressrel/10443.pdf>, EDL# 10443
- Overview (FHWA-OP-99-036): <http://www.itsdocs.fhwa.dot.gov/jpodocs/pressrel/10443.pdf>, EDL# 10443



The Application of Various Digital Subscriber Line (xDSL) Technologies to ITS (1999)

This series of two reports assesses the application of digital subscriber line (DSL or xDSL) technologies to ITS, particularly their use for traffic video. Traffic Video Laboratory Assessments discusses several types of DSL technologies and describes the concept of xDSL-based traffic video. Traffic Video Field Assessments documents the field testing of an xDSL-based traffic video prototype.

Cost: Free

To Access This Resource: Access the following website addresses:

- Traffic Video Laboratory Assessments: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/9306.pdf, EDL# 9306
- Traffic Video Field Assessments: http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/10103.pdf, EDL# 10103



The Role of Access Policies in Wireline Shared Resource Projects (FHWA-OP-99-037) (1999)

This paper provides background information for evaluating a possible relationship between the geographic extent of broadband telecommunications infrastructure available for general use and the degree and type of control exercised by the public right-of-way (ROW) owner over infrastructure placement in limited access highway ROW. In addition to exploring telecommunications infrastructure with regard to universal service, i.e., geographic coverage of a state, this paper also explores the extent and depth of telecommunications support for public sector activities, focusing on ITS and other transportation activities.

Cost: Free

To Access This Resource: Access the website address http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/9907.pdf.



ITS Telecommunications Overview (NHI Course# 137005)

This course provides a broad introduction to the fundamentals of wireline and wireless telecommunications systems as they apply to ITS. The course covers key terms and concepts, requirements analysis, regional ITS architectures used in telecommunications planning, and institutional and organizational issues. Target Audience: Transportation managers and engineers involved in policymaking, procurement, planning, program development and legal aspects of ITS infrastructure deployment. Course Length: Eight hours.

Cost: \$200 per participant

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137005."



Introduction to Telecommunications Technology

This course introduces ITS telecommunications to those who have little or no previous exposure to the issues surrounding the deployment and use of telecommunications infrastructure. The course introduces participants to the fundamentals of wireline and wireless telecommunications systems and concludes with a brief discussion of the telecommunications technology acquisition process. Skill Level: Core learning. Target Audience: Transportation managers and engineers involved in policymaking, procurement, planning, program development, and legal aspects of ITS infrastructure deployment. A blended Web-based version provides online interaction between participants and instructors. The Web-based version is also available in Spanish. Course Length: Eight hours.

Cost: \$175 per participant for the Web-based version; \$250 per participant for the blended version.

To Access This Resource: Access the website address <http://www.citeconsortium.org/courses/1mod3.html> or contact Kathleen Frankle, Consortium of ITS Training and Education (CITE), (410) 414-2925, KFrankle@umd.edu.



Advanced Telecommunications Technology

This course provides a system-level understanding of the operation of modern broadband transportation communications networks. This course focuses on how to plan and implement telecommunications networks to support major ITS infrastructure. Target Audience: Public sector transportation professionals including Federal engineers, planners, project managers, and field staff and others as appropriate. Transportation professionals from state, regional, and local agencies would also benefit from participation in the course. Course Length: Eight hours. A blended Web-based version provides online interaction between participants and instructors.

Cost: \$175 per participant for the Web-based version; \$250 per participant for the blended version.

To Access This Resource: Access the website address <http://www.citeconsortium.org/courses/2mod8.html> or contact Kathleen Frankle, Consortium of ITS Training and Education (CITE), (410) 414-2925, KFrankle@umd.edu.



A Primer on Wireless Data Transport Systems: Wireless Trends, Tools and Tips

This course provides an introduction to wireless data transmission technologies. The course discusses trends in wireless data transmission as well as various ways to structure a wireless network (i.e., architectures) and offers tips on how to choose from among these options. The course explores the advantages and disadvantages of using frequencies that are not licensed by the Federal Communications Commission (FCC) and can therefore be used for free. Finally, the course presents a list of relevant standards and discusses which standards apply to which wireless technologies. This interactive Web-based training course ("webinar"), offered August 14, 2007, has been archived in several formats: the MS PowerPoint presentation given, a transcript that includes the question and answer period, and an audio recording with simultaneous text captioning. This session is the first in a series of webinars that will focus on wireless data transport for traffic and ITS. Subsequent webinars in the series will take place in fall 2007 and winter/spring 2008.

Cost: Free

To Access This Resource: Access the following website addresses:

- MS PowerPoint presentation: http://www.pcb.its.dot.gov/t3/s070814/combined_080907.ppt
- Transcript of presentation in HyperText Markup Language (HTML): http://www.pcb.its.dot.gov/t3/s070814/s070814_wireless_presentation.asp
- Transcript of question and answer period in HyperText Markup Language (HTML) format: http://www.pcb.its.dot.gov/t3/s070814/s070814_wireless_qa.asp
- Audio recording using Macromedia® Flash®: http://www.pcb.its.dot.gov/t3/s070814/T3_070814.html



Training Points-of-Contact

- Linda Dodge, ITS Joint Program Office, (202) 366-8034, Linda.Dodge@dot.gov
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- Tom Stout, FHWA Office of Transportation Management, (202) 366-6054, Tom.Stout@dot.gov
- Ben Gribbon, FHWA Office of Safety, (202) 366-1809, Ben.Gribbon@dot.gov
- Michael Baltes, FTA Office of Mobility Innovation, (202) 366-2182, Michael.Baltes@dot.gov
- Charlene Wilder, FTA Service Innovation Division, (202) 366-1077, Charlene.Wilder@dot.gov
- Julie Lane, FMCSA Office of Analysis, Research and Technology, (202) 385-2391, Julie.Lane@dot.gov
- Carolyn Temperine, FMCSA Eastern Service Center, (518) 431-4239 x270, Carolyn.Temperine@dot.gov
- Bud Cribbs, National Highway Institute, (703) 235-0526, Bud.Cribbs@dot.gov
- Renee Haider, National Transit Institute, (732) 932-1700, x223, RHaider@nti.rutgers.edu

<http://>

ITS Professional Capacity Building Section of the ITS Joint Program Office Website

This website is the official site of the U.S. DOT's ITS Professional Capacity Building (PCB) Program and presents a compilation of resources related to training, professional development, formal education, and sources of technical assistance in ITS. The national PCB website links to local and regional PCB programs in California, Massachusetts, Montana, North Dakota and Wyoming, as well as educational websites geared towards a wide array of audiences, including ITS professionals, transportation decisionmakers, university students and K-12 students. A calendar lists ITS training courses taught by several organizations, including

the Consortium of ITS Training and Education (CITE), National Highway Institute (NHI), National Transit Institute (NTI), Institute of Transportation Engineers (ITE) and Intelligent Transportation Society of America (ITS America or ITSA). The Talking Technology and Transportation (T3) program lists upcoming and past archived Web-based seminars ("webinars") on a wide array of ITS-related topics. The PCB website is also a gateway to the ITS Peer-to-Peer Program, which provides short-term assistance to public sector representatives on a variety of ITS-related topics.

Cost: Free

To Access This Resource: Access the website address <http://www.pcb.its.dot.gov>.



Talking Technology and Transportation (T3) Web Seminars

The Talking Technology and Transportation (T3) Web-based seminars ("webinars") are interactive conferences with instruction provided via both telephone and the Internet. Sponsored by the ITS Joint Program Office's Professional Capacity Building Program, these seminars cover a wide range of topics. Topics of recent T3 seminars include improving highway safety with ITS, guidelines for successful ITS procurement, software acquisition for project managers, and transit fare collection standards. Most seminars consist of one hour of presentation by instructors or panelists and a half-hour question and answer period. About 100 to 250 people participate in each seminar. Past seminars are archived on the T3 website, so even people who missed the seminar can review the material presented.

Cost: Free

To Access This Resource: Access the website address http://www.pcb.its.dot.gov/res_t3.asp to view a calendar of upcoming seminars and archives of past ones.



ITS Awareness Seminar (NHI Course# 137001)

This course provides an overall understanding of intelligent transportation systems (ITS) and ITS infrastructure. The course illustrates ITS infrastructure components by showcasing those

systems that are deployed around the country. Institutional and technical issues in deployment of ITS infrastructure are also presented. Topics covered include planning, design, architecture, standards, procurement, installation and construction, operation and maintenance, and funding. Skill Level: Awareness learning. Target Audience: Transportation professionals who are currently not generally involved in ITS, but expect to be involved in ITS planning, implementation, operations, or maintenance. This course is available in both classroom and Web-based versions. Course Length: One day for the classroom version; four hours for the Web-based version.

Cost: \$200 per participant for the classroom version; \$50 per participant for the Web-based version.

To Access This Resource:

- For the classroom version, access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number “137001.”
- For the Web-based version, access the website address <http://www.citeconsortium.org/courses/itsawareness.html> or contact Kathleen Frankle, Consortium of ITS Training and Education (CITE), (410) 414-2925, KFrankle@umd.edu.



Deploying Integrated ITS—Metropolitan (NHI Course# 137002)

This course supports integrated ITS infrastructure deployment with consideration of the National ITS Architecture. The regional context in which the public components of ITS infrastructure will be implemented and integrated is emphasized. The course combines the technical and institutional components of deployment. The importance of each component is discussed and placed in the context of regional decisions that must be made by state and local agencies. Skill Level: Core learning. Target Audience: Transportation program managers who are currently involved in ITS or expect to be involved in ITS planning, implementation, operations, or maintenance. Course Length: Two days.

Cost: \$300 per participant

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number “137002.”



ITS Telecommunications Overview (NHI Course# 137005)

This course provides a broad introduction to the fundamentals of wireline and wireless telecommunications systems as they apply to ITS. The course covers key terms and concepts, requirements analysis, use of regional ITS architectures in telecommunications planning, and institutional and organizational issues. Target Audience: Transportation managers and engineers involved in policymaking, procurement, planning, program development and legal aspects of ITS infrastructure deployment. Course Length: Eight hours.

Cost: \$200 per participant

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137005."



Rural ITS Toolbox (NHI Course# 137007)

This course describes many ITS-related practices and techniques that have been applied successfully to rural transportation problems, which are described in the *Rural ITS Toolbox* document. The training course goes into further detail by including problem solving techniques and training for the course participant to describe ITS technologies to their stakeholders. This course will help participants identify cost-effective ITS technologies that can address rural transportation problems. Skill Level: Core learning. Target Audience: County, municipal, and town executives; traffic engineers; state, Federal, and local transportation planners and operations personnel; motor carrier managers; environmental groups; information technology (IT) personnel; academia; consultants; and contractors. Course Length: Eight hours.

Cost: \$200 per participant

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137007."



Using the National ITS Architecture for Deployment (NHI Course# 137013)

The objective of this course is to demonstrate in an interactive workshop format how to apply tools and methodologies developed by the National ITS Architecture Team for the U.S. DOT. Topics covered include transportation services, subsystems and terminators, information flows, market packages, ITS standards, developing an ITS architecture, logical architecture, using an architecture for project deployment, user service requirements and the theory of operations, and the FHWA's Final Rule and FTA's Policy on ITS Architecture and Standards. Skill Level: Core learning. Target Audience: This course is primarily for a public sector audience involved in ITS planning, deployment, and operations; systems integrators from the private sector would also benefit. Course Length: Two days.

Cost: \$300 per participant. The course fee includes a copy of the National ITS Architecture Version 6.0 on CD-ROM.

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137013."



ITS Software Acquisition (NHI Course# 137019)

This course provides a general understanding of the many issues involved in the development, management, and deployment of ITS software. Topics covered include the challenges software projects present and how to overcome them, the guiding principles to use for acquiring software successfully, and selection of an appropriate contracting mechanism. Skill Level: Core learning. Target Audience: State and local personnel, such as project leaders, who will be involved in ITS projects that have a significant software component to them. FHWA Resource Center and Division office personnel who are involved in coordinating these projects would also benefit. Course Length: Two days.

Cost: \$300 per participant

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137019."



Intelligent Transportation System (ITS) Procurement (NHI Course# 137020)

This seminar is intended to heighten awareness of the challenges in procuring ITS within the traditional construction project environment. This seminar combines lectures with presentations of case studies to describe the lessons learned from past ITS projects, and explain how best practices can be instituted to help ensure successful ITS procurement. This seminar is a companion to, but not a prerequisite to, ITS Software Acquisition. Skill Level: Core learning. Target Audience: Federal, state, and local transportation professionals directly involved in procuring ITS systems, especially those responsible for developing and reviewing statements-of-work for ITS procurement, including program managers, contracting officers, and attorneys. Course Length: One day.

Cost: \$200 per participant

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137020."



CORSIM Traffic Simulation Model Training (NHI Course# 137022)

This seminar provides an understanding of CORridor SIMulation (CORSIM), a tool that simulates traffic and traffic control conditions on combined surface street and freeway networks. CORSIM determines how traffic engineering and control strategies impact a prescribed network's operational performance, as expressed in terms of various measures of effectiveness (MOEs). The MOEs, such as speed and delay, provide insights into the effects of the applied strategy on traffic operations and provide the basis for optimizing the applied strategy. Skill Level: Specialized learning. Target Audience: Traffic engineering technical staff from Federal, state, and local agencies. Course Length: Three days.

Cost: \$400 per participant. The sponsoring organization is responsible for providing 200 Mhz microcomputers with Windows 95 or Windows NT or better, color monitors, and a hard disk with 50 Mb free storage memory.

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137022."



Introduction to Systems Engineering for Advanced Transportation (NHI Course# 137024)

This course provides an introduction to systems engineering for ITS project managers and staff, allowing participants to understand the benefits of applying systems engineering approaches to developing quality systems. The course covers both technical practices (modeling, prototyping, trade-off analysis, and testing) and management practices (risk analysis and mitigation). Skill Level: Core learning. Target Audience: Transportation engineers and other information technology (IT) professionals and technical staff at all levels of the public and private sectors, including ITS project managers, technical team members, contractors, and staff. Project managers in particular may benefit from this course. This course is available in classroom, Web-based and blended instructor-led/Web-based versions. Course Length: Two days for the classroom version; 10 hours for the Web-based and blended versions.

Cost: \$300 per participant for the classroom version; \$175 per participant for the Web-based version; \$250 per participant for the blended version.

To Access This Resource:

- For the classroom version, access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137024."
- For the Web-based and blended versions, access the website address <http://www.citeconsortium.org/courses/SE101.html> or contact Kathleen Frankle, Consortium of ITS Training and Education (CITE), (410) 414-2925, KFrankle@umd.edu.



Managing High Technology Projects in Transportation (NHI Course# 137026)

The goal of this course is to improve the project management skills of both public and private sector personnel responsible for managing the implementation of technology-intensive transportation projects. The course provides training on the fundamental principles and practices of good project management; the steps to be taken for the planning, design,

and implementation of transportation systems projects; the types of project management tools available; and the basic skills required to be a good project manager. Skill Level: Core learning. Target Audience: Current and prospective project managers from state and local transportation agencies, as well as those in the private sector who support the implementation of advanced transportation projects. Course Length: Two days. This course is available in classroom, Web-based and blended instructor-led/ Web-based versions. Course Length: Two days for the classroom version; eight hours for the Web-based and blended versions.

Cost: \$300 per participant for the classroom version; \$200 per participant for the Web-based version; \$250 per participant for the blended version.

To Access This Resource:

- For the classroom version, access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137026."
- For the Web-based and blended versions, access the website address <http://www.citeconsortium.org/courses/2mod11.html> or contact Kathleen Frankle, Consortium of ITS Training and Education (CITE), (410) 414-2925, KFrankle@umd.edu.



Turbo Architecture Software Training (NHI Course# 137029A)

This course provides training on how to use Turbo Architecture, which is a software tool for regional and project-specific architecture development. Target Audience: Public sector transportation professionals at the state, county, city, and metropolitan planning organization (MPO) levels, as well as private sector consultants, who are developing regional and project architectures. Skill Level: Specialized training. Course Length: Two days.

Cost: \$300 per participant. The sponsoring organization is responsible for providing 400 Mhz microcomputers running Windows SE or better, color monitors, and a hard disk with 50 Mb free storage memory.

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137029A."



Principles and Tools for Road Weather Management (NHI Course# 137030)

This course helps those involved in highway maintenance and operations develop techniques and strategies for tackling road weather problems. This course provides basic knowledge of meteorology and addresses the technological resources available to support highway personnel in making effective road weather management decisions. Key topics covered in the course include the impacts of weather on highway operations, fundamentals of meteorology including how it pertains to Road Weather Information Systems (RWIS), technical and institutional resources available for implementing RWIS and a range of effective and open solutions to various types of road weather conditions and for various management practices. The course focuses heavily on resources and solutions, and how those solutions can reduce the impact of adverse weather on the traveling public and the highway agency. Target Audience: Transportation engineers, planners, managers, public works personnel, safety engineers, systems engineers, operators, maintenance personnel and emergency personnel. Course Length: One Day

Cost: \$200 per participant

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137030."



Configuration Management (CM) for Traffic Management Systems (NHI Course# 137042)

Configuration management (CM) is the practice of handling changes systematically so that a facility maintains its integrity over time. CM involves policies, procedures, techniques, and tools to manage and evaluate proposed project changes, track the status of changes, and maintain an inventory of system and support documents. This course presents issues surrounding CM and recommended practices for agencies to consider in a modular manner. A two-day version of the course presents all 10 modules. The sponsor may select modules to be presented in the one-day version of the course. Target Audience: Any individual involved in

the planning, design, implementation, management, operation, or maintenance of transportation systems, including representatives of metropolitan planning organizations, traffic management centers, state and local governments, FHWA, universities, and consultants. Course Length: Two days.

Cost: \$300 per participant

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137042."



Integrated Transportation Management for Small- and Medium-Sized Communities (NHI Course# 137043)

This course introduces the use of Advanced Transportation Management Systems (ATMS) and Advanced Traveler Information Systems (ATIS) when deployed in small and medium-sized communities. This course provides participants with the basic knowledge and resources needed to begin the process of planning for ATMS and ATIS in small and medium sized communities. Target Audience: Transportation professionals involved in the planning, design, implementation, and operation of ITS in small and medium sized communities. Course Length: One day.

Cost: \$200 per participant

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137043."



Improving Highway Safety with Intelligent Transportation Systems (ITS) (NHI Course# 137044)

The goal of this course is to increase awareness of the highway safety benefits offered by ITS technologies. Highway safety benefits may be experienced at the highway system, mainstream (highway improvement project) and stand-alone project level. The course surveys the participants on their experiences deploying ITS for highway safety improvements and reviews

procedures and requirements of safety strategic planning and the ITS deployment process. Ideally, participants will comprise a 50/50 split between safety and ITS personnel so that experiences, expectations and contributions will be shared. This course is available in classroom and Web-based versions. Target Audience: Both ITS and safety professionals. Course Length: Two days for the classroom version; eight hours for the Web-based version.

Cost: \$300 per participant for the classroom version; \$175 per participant for the Web-based version.

To Access This Resource:

- For the classroom version, access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "137044."
- For the Web-based version, access the website address <http://www.citeconsortium.org/courses/HighwaySafety.html> or contact Kathleen Frankle, Consortium of ITS Training and Education (CITE), (410) 414-2925, KFrankle@umd.edu.



Traffic Signal Design and Operation (NHI Course# 133028)

This course addresses the application of the *Manual on Uniform Traffic Control Devices (MUTCD)* to intersection displays, as well as signal timing, computerized traffic signal systems, control strategies, integrated systems, traffic control simulation, and optimization software. Upon completion of this course, participants will gain an understanding of the congestion and delays that exist on streets and roadways, and how these delays can be managed through effective traffic signal timing and optimization. The course is divided into two parts: Traffic Signal Timing and Design, and Traffic Signal Systems. Skill Level: Specialized learning. Target Audience: Federal, state, and local traffic engineers involved in the design, review, and inspection of traffic control projects. Course Length: Two days.

Cost: \$300 per participant. The course fee includes a copy of the *Manual of Traffic Signal Design, Second Edition*.

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "133028."



Managing Traffic Incident and Roadway Emergencies (NHI Course# 133048 or 133048A)

This course addresses the concepts and techniques of traffic incident management. The course focuses on the safety and operational efficiency of responding agencies and the institutional and administrative barriers that hinder interagency cooperation. Course modules cover the main groupings of topics: on-scene traffic incident management operations, multi-agency communications, and program management. Skill Level: Core learning. Target Audience: This course is designed for a multi-agency, multi-disciplinary audience of mid- and upper-level managers from transportation, law enforcement, fire and rescue, emergency medical, emergency communications, and other agencies that respond to traffic incidents. In addition, the target audience also includes private sector responders from towing and recovery companies, hazardous materials contractors, and traffic reporting media. Course Length: One or two days.

Cost: \$4,500 or \$6,900 per session (between \$128 and \$345 per participant depending on the number of participants and course length).

To Access This Resource: Contact the NHI Training Team, (703) 235-0534, nhitraining@fhwa.dot.gov or access the website addresses:

- One-day course: http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "133048"
- Two-day course: http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "133048A"



Freeway Management and Operations (NHI Course# 133075 or 133075A)

This course provides participants with an appreciation and understanding of the key policies, institutional issues, challenges and barriers, technical, and other issues to consider in the planning, design, implementation, management, operation, evaluation, and marketing of freeway facilities. The key topics covered include introduction to freeway management and operations, freeway management as a component of traffic

operations programs, performance monitoring and evaluation, roadway and operational improvements, ramp management and control, lane management and control, high-occupancy vehicle (HOV) systems, traffic incident management, planned special events, information dissemination, transportation management centers, information sharing and integration, detection and surveillance, and communication media. This course addresses basic traffic flow theory for freeways and evaluation of freeway operations during project development and design. In addition, this course provides information on freeway traffic control systems, traffic management centers, and operations analysis procedures for freeways. Skill Level: Specialized learning. Target Audience: Federal, state, and local transportation professionals involved in planning, design, and implementation of freeway traffic operational improvements. Course Length: Two or three days.

Cost: \$300 per participant for the two-day course; \$400 per participant for the three-day course.

To Access This Resource: Access the following website addresses:

- Two-day course: http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "133075"
- Three-day course: http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "133075A"



Access Management, Location and Design (NHI# 133078)

This course presents the fundamentals of access management (AM) along highways and arterial streets. Topics covered in this course include the benefits of AM, AM practices and policies from various states and jurisdictions, warrants, design guidelines for the application of AM, retrofit programs, and evaluation of AM's impact on safety and operations. Target Audience: Engineers and planners at the Federal, state and local levels who expect to be involved in decisions about access to new or existing sites. Course Length: Three days.

Cost: \$400 per participant. The course fee includes a copy of the Transportation Research Board's *Access Management Manual*.

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "133078."



Advancing Transportation Systems Management and Operations (NHI Course# 133098)

This course provides an understanding of Transportation Systems Management and Operations (TSM&O) in a regional context. The transportation challenges of the 21st century require a significant cultural shift in the way transportation systems are managed and operated. This means moving from limited interactions between planners and operators to a solid linkage that facilitates data sharing, joint development of regional operations opportunities, resource sharing, and supportive institutional arrangements. From an operations perspective, this cultural shift requires anticipating user needs 24/7, focusing on customers, and changing policies and procedures to be performance-based. To be successful, the new norm requires a cross-jurisdictional, multi-agency, and multimodal perspective. From a planning standpoint, this cultural shift means bringing “operations thinking” into the planning process. Smart planning requires that ongoing operations be considered in regional planning and investment decisions. This course explores 21st century transportation challenges and how to advance TSM&O through a cultural shift in operations and planning. Target Audience: Transportation managers, service providers, public safety officials, public works directors, and business sector members of chambers of commerce. Operators and planners from states, cities, counties and metropolitan planning organizations (MPOs) also benefit from this course. Course Length: One day.

Cost: \$200 per participant

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number “133098.”



Managing Travel for Planned Special Events (NHI Course# 133099 or 133099A)

This course provides participants with the ability to identify and discuss the key phases, institutional issues, challenges, techniques, and other issues to consider in coordinating, planning, managing, and controlling traffic for planned special events. The following key topics are covered in the course: planned special

events overview, pre-event planning and coordination, traffic management plan and travel demand management initiatives, implementation activities, day-of-event activities, and post-event activities. Participants will be able to apply the recommended concepts and techniques with all five key phases involved with managing travel for a planned special event: (1) program planning, (2) event operations planning, (3) implementation activities, (4) day-of-event activities, and (5) post-event activities. The course will refer to FHWA's *Managing Travel for Planned Special Events Handbook*. The course will guide participants on how to apply key concepts contained in the handbook. Target Audience: The target audience includes transportation managers, service providers, public safety officials, public works directors, and business sector members of chambers of commerce. Operators and planners from states, cities, counties and metropolitan planning organizations (MPOs) would also benefit from this course. Course Length: One or two days. The two-day version includes scenario-based exercises in a workshop format.

Cost: \$200 per participant for the one-day course; \$300 per participant for the two-day course.

To Access This Resource: Access the following website addresses:

- One-day course: http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "133099A"
- Two-day course: http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "133099"



Railroad-Highway Grade Crossing Improvement Program (NHI# 380005)

This course presents a broad overview of various options for improving highway-rail intersections, also called railroad grade crossings. The course covers historical background, definition of grade crossing components, collection and maintenance of data, assessment of crossing safety and operations, identification and selection of improvement alternatives, program and project development and implementation, maintenance, private crossings, and the Operation Lifesaver program. The workshop format enables participants to apply the material in a series of exercises. Target Audience: Representatives of Federal, state, and local transportation agencies responsible for the design,

construction and maintenance of highway-rail intersections. Also, state and local traffic engineers responsible for highway-railroad grade crossing safety. Course Length: Two days.

Cost: \$300 per participant

To Access This Resource: Access the website address http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx and search for course number "380005."



Advanced Systems Engineering for Advanced Transportation Projects

This Web-based distance-learning course covers a broad set of topics in systems engineering and systems integration. The course provides participants with an appreciation of the principles of systems engineering and its application to ITS projects. In addition, this course introduces participants to techniques of systems integration associated with regional systems. Introduction to Systems Engineering is recommended, but not required, before taking this course. Skill Level: Specialized learning. Target Audience: Transportation engineering and information technology (IT) professionals involved in the implementation of ITS, plus graduate students pursuing a concentration in ITS. A blended Web-based version provides online interaction between participants and instructors. Course Length: 10 hours.

Cost: \$200 per participant for the Web-based version; \$250 per participant for the blended version.

To Access This Resource: Access the website address <http://www.citeconsortium.org/courses/syseng.html> or contact Kathleen Frankle, Consortium of ITS Training and Education (CITE), (410) 414-2925, KFrankle@umd.edu.



Advanced Telecommunications Technology

This course provides a system-level understanding of the operation of modern broadband transportation communications networks. This course focuses on how to plan and implement telecommunications networks to support major ITS infrastructure. Target Audience: Public sector transportation professionals including Federal engineers, planners, project

managers, and field staff and others as appropriate. Transportation professionals from state, regional, and local agencies would also benefit from participation in the course. Course Length: Eight hours. A blended Web-based version provides online interaction between participants and instructors.

Cost: \$175 per participant for the Web-based version; \$250 per participant for the blended version.

To Access This Resource: Access the website address <http://www.citeconsortium.org/courses/2mod8.html> or contact Kathleen Frankle, Consortium of ITS Training and Education (CITE), (410) 414-2925, KFrankle@umd.edu.



Introduction to the National ITS Architecture

This Web-based distance learning course provides students with a broad overview of the National ITS Architecture and the role it plays in planning, designing, and implementing ITS. The course provides background (what the National ITS Architecture is, how it is defined, why it was established, and its goals and objectives) and introduces the concept of ITS user services. Basic concepts and models of systems engineering are addressed, as well as the physical architecture through examples of local implementations of the National ITS Architecture. Specific elements of the physical architecture, such as subsystems and terminators, are presented in detail. Skill Level: Awareness learning. Target Audience: Transportation professionals wanting to enhance their knowledge of and skills for using the National ITS Architecture. Course Length: Eight hours.

Cost: \$75 per participant

To Access This Resource: Access the website address <http://www.citeconsortium.org/courses/initisa.html> or contact Kathleen Frankle, Consortium of ITS Training and Education (CITE), (410) 414-2925, KFrankle@umd.edu.



Introduction to Telecommunications Technology

This course introduces ITS telecommunications to those who have little or no previous exposure to the issues surrounding the deployment and use of telecommunications infrastructure.

The course introduces participants to the fundamentals of wireline and wireless telecommunications systems and concludes with a brief discussion of the telecommunications technology acquisition process. Skill Level: Core learning. Target Audience: Transportation managers and engineers involved in policymaking, procurement, planning, program development, and legal aspects of ITS infrastructure deployment. A blended Web-based version provides online interaction between participants and instructors. The Web-based version is also available in Spanish. Course Length: Eight hours.

Cost: \$175 per participant for the Web-based version; \$250 per participant for the blended version.

To Access This Resource: Access the website address <http://www.citeconsortium.org/courses/1mod3.html> or contact Kathleen Frankle, Consortium of ITS Training and Education (CITE), (410) 414-2925, KFrankle@umd.edu.



Roles of the Public & Private Sectors in ITS: Cooperative Partnerships

This course examines some of the critical success factors of cooperative partnerships and offers a suggested approach to partnering. The course presents important issues (legal, regulatory, procurement, public policy, etc.) associated with the establishment of partnerships. In addition, the course provides real-life examples of both successful and unsuccessful attempts at partnerships in the area of ITS. Target Audience: Public sector transportation professionals including Federal engineers, planners, project managers, and field staff and others as appropriate. Transportation professionals from state, regional, and local agencies would also benefit from participation in the course. Course Length: Eight hours.

Cost: \$175 per participant

To Access This Resource: Access the website address <http://www.citeconsortium.org/courses/2mod12.html> or contact Kathleen Frankle, Consortium of ITS Training and Education (CITE), (410) 414-2925, KFrankle@umd.edu.



Characteristics and Planning of Bus Rapid Transit (BRT)

This course presents an overview of bus rapid transit (BRT), based on the 2004 report *Characteristics of Bus Rapid Transit for Decision-Making*. The course discusses the major elements of BRT, including running way, stations, vehicles, fare collection, ITS, and service and operating plans. The course also explores how different combinations of these elements can result in different combinations of benefits, such as reduced travel time, increased reliability, increased safety and security, increased capacity, and increased brand recognition and a positive image which, in turn, can lead to increased ridership, customer loyalty, community support. Numerous case studies are used to illustrate concepts presented in the course. Course Length: Two days.

Cost: Free for Federal, state, and local government employees; \$450 for contractors and consultants.

To Access This Resource: Access the website address <http://www.ntionline.com/CourseInfo.asp?CourseNumber=ID030> or contact Susan Greenstone, National Transit Institute, (732) 932-1700 x219, SGreenstone@nti.rutgers.edu.



Intelligent Transportation Staffing

Human resources are the key to a successful deployment of ITS in a transit agency. It is important that organizations have people in place that know how to create disparate parts of an organization into a team, set realistic goals, implement and use the technology, interpret the data, and derive the optimum benefits from the system. These staffing needs transcend all departments. How does an agency that is planning an ITS deployment ensure that its organization is appropriately staffed to ensure a successful and profitable implementation? This course will address these questions and provide participants with a toolkit to recruit, interview, hire, train and retain employees who are critical to an ITS purchase and deployment. Target Audience: Transit managers, human resource personnel, employees assigned to an ITS project who need additional personnel, consultants, decision-makers, project management managers, and staff of agencies participating in regional ITS projects. State departments of transportation, metropolitan planning organizations (MPOs), and county and

municipal government staff would also benefit from this course.
Course Length: Two days.

Cost: Free for Federal, state, and local government employees; \$300 for contractors and consultants.

To Access This Resource: Access the website address <http://www.ntionline.com/CourseInfo.asp?CourseNumber=ID050> or contact Susan Greenstone, National Transit Institute, (732) 932-1700 x219, SGreenstone@nti.rutgers.edu.



Multimodal Traveler Information Systems

The course identifies the issues, requirements, recommendations, lessons learned and best practices of implementing and operating advanced traveler information systems (ATIS). The course discusses the different types of traveler information that ATIS can provide, including transit information, traffic information and multimodal information, as well as various ATIS delivery mechanisms such as 511. The course explores how pre-trip information, including automated trip itinerary planning, differs from information that travelers want while en route. Participants will learn how to measure customer preferences and how to respond to what customers prefer. Finally, the course discusses relevant ITS standards and conformity with the National ITS Architecture.

Cost: Free for Federal, state and local government employees; \$300 for contractors and consultants.

To Access This Resource: Access the website address <http://www.ntionline.com/CourseInfo.asp?CourseNumber=ID007A> or contact Susan Greenstone, National Transit Institute, (732) 932-1700 x219, SGreenstone@nti.rutgers.edu.



Transit ITS Regional Workshop

This introductory-level workshop explores how the core suite of transit ITS technologies can increase the safety and efficiency of transit systems. In this course, participants will learn what the core suite of transit ITS technologies are and how they can be integrated into the wider context of regional transportation goals using a regional ITS architecture. The course will also address best practices in systems engineering, procurement of advanced technologies, and strategic planning. Case studies from successful

transit ITS applications will be used to illustrate their benefits.
Course Length: Two days.

Cost: Free for Federal, state, and local government employees; \$300 for contractors and consultants.

To Access This Resource: Access the website address <http://www.ntionline.com/CourseInfo.asp?CourseNumber=TRI-26> or contact Susan Greenstone, National Transit Institute, (732) 932-1700 x219, SGreenstone@nti.rutgers.edu.



Introduction to ITS/CVO and CVISN (CVISN 101)

This Web-based course provides an introduction to the ITS/CVO program and the Commercial Vehicle Information Systems and Networks (CVISN) initiative. The course includes a short discussion of some of the problems currently existing in CVO, and an overview of the four main areas of the ITS/CVO program: Safety Assurance, Credentials Administration, Electronic Screening, and Carrier Operations. The concepts underlying current and future strategies are described for each of these areas, as well as the technologies used to carry them out. The discussion of CVISN focuses on the Level 1 capabilities (Safety Information Exchange, Electronic Credentialing and Electronic Screening) and the deployment process developed for their implementation.

Target Audience: Public sector transportation professionals including Federal engineers, planners, project managers, and field staff and others as appropriate. Transportation professionals from state, regional, and local agencies would also benefit from participation in the course. A blended Web-based version provides online interaction between participants and instructors.
Course Length: Six hours.

Cost: \$150 per participant for the Web-based version; \$175 per participant for the blended version.

To Access This Resource:

- Access the website address <http://www.citeconsortium.org/courses/2mod3.html>.
- Contact Julie Lane, FMCSA Office of Analysis, Research and Technology, (202) 385-2391, Julie.Lane@dot.gov or Carolyn Temperine, FMCSA Eastern Service Center, (518) 431-4239 x270, Carolyn.Temperine@dot.gov.



Advanced CVISN (CVISN 102)

This comprehensive course builds on the knowledge gained in CVISN 101 by delving into the specifics of the Commercial Vehicle Information Systems and Networks (CVISN) initiative. In this course, students will explore effective outreach strategies for securing ongoing support and buy-in to CVISN and learn how to meet funding challenges throughout the CVISN life cycle. Students will investigate CVISN's primary objective—to develop and deploy information systems that support capabilities in Safety Information Exchange, Credentials Administration, and Electronic Screening. In addition, the course presents a variety of best practices related to CVISN issues in states. Target Audience: Public sector transportation professionals including Federal engineers, planners, project managers, and field staff and others as appropriate. Transportation professionals from state, regional, and local agencies would also benefit from participation in the course. A blended Web-based version provides online interaction between participants and instructors. Course Length: Eight to 10 hours.

Cost: \$175 per participant for the Web-based version; \$250 per participant for the blended version.

To Access This Resource:

- Access the website address <http://www.citeconsortium.org/courses/CVISN102.html>.
- Contact Julie Lane, FMCSA Office of Analysis, Research and Technology, (202) 385-2391, Julie.Lane@dot.gov or Carolyn Temperine, FMCSA Eastern Service Center, (518) 431-4239 x270, Carolyn.Temperine@dot.gov.



A Primer on Wireless Data Transport Systems: Wireless Trends, Tools and Tips

This course provides an introduction to wireless data transmission technologies. The course discusses trends in wireless data transmission as well as various ways to structure a wireless network (i.e., architectures) and offers tips on how to choose from among these options. The course explores the advantages and disadvantages of using frequencies that are not licensed by the Federal Communications Commission (FCC) and can therefore be used for free. Finally, the course presents a list of relevant standards and discusses which standards apply to which

wireless technologies. This interactive Web-based training course ("webinar"), offered August 14, 2007, has been archived in several formats: the MS PowerPoint presentation given, a transcript that includes the question and answer period, and an audio recording with simultaneous text captioning. This session is the first in a series of webinars that will focus on wireless data transport for traffic and ITS. Subsequent webinars in the series will take place in fall 2007 and winter/spring 2008.

Cost: Free

To Access This Resource: Access the following website addresses:

- MS PowerPoint presentation: http://www.pcb.its.dot.gov/t3/s070814/combined_080907.ppt
- Transcript of presentation in HyperText Markup Language (HTML): http://www.pcb.its.dot.gov/t3/s070814/s070814_wireless_presentation.asp
- Transcript of question and answer period in HyperText Markup Language (HTML) format: http://www.pcb.its.dot.gov/t3/s070814/s070814_wireless_qa.asp
- Audio recording using Macromedia® Flash®: http://www.pcb.its.dot.gov/t3/s070814/T3_070814.html



DMS Procurement Workshop

This workshop discusses the nuts and bolts of a successful dynamic message sign (DMS) procurement. Participants will learn to develop methods for incorporating National Transportation Communications for ITS Protocol (NTCIP) standards into their DMS specifications. The workshop gives participants practical, ready-to-use information on a full range of topics related to the procurement of standards-based DMS systems. Target Audience: Public and private sector professionals responsible for specifying and procuring ITS-related equipment and services. Transportation/ITS engineers, project managers, technical team members (specification writers), consultants, contractors, and operators will all benefit from the workshop. Course Length: Two days.

Cost: Free

To Access This Resource: Access the website address http://www.ops.fhwa.dot.gov/int_its_deployment/standards_imp/dmswshp.htm or contact Tom Stout, FHWA Office of Transportation Management, (202) 366-6054, Tom.Stout@dot.gov.



Guidelines for Successful ITS Procurement

This course presents the eight-step decision model for procurement of ITS products and services presented in NCHRP Report# 560 *Contracting for ITS Projects*, as well as a Web-based software tool of the same name. Steps in the decision model include assessment of the complexity and risk of ITS project for which the procurement is taking place, selection of applicable systems engineering processes and procurement packages, and defining the scope, terms and conditions of a final contract. This interactive Web-based training course ("webinar"), offered March 15, 2006, has been archived in several formats: the MS PowerPoint presentation given, a transcript that includes the question and answer period, and an audio recording with simultaneous text captioning.

Cost: Free

To Access This Resource: Access the following website addresses:

- MS PowerPoint presentation: http://www.pcb.its.dot.gov/T3/session29/T3_S29_ppt.ppt
- Transcript in HyperText Markup Language (HTML) format: <http://www.pcb.its.dot.gov/t3/session29/session29text.asp>
- Audio recording using Macromedia® Flash®: http://www.pcb.its.dot.gov/T3/session29/T3_29_Flash.html



ITS Architecture Use and Maintenance Workshop

This two-day workshop will help participants understand how a regional ITS architecture can be used in regional and statewide transportation planning and project deployment. Participants will gain insight into the decisions and process steps involved in maintaining a regional ITS architecture. Workshops will be customized for individual regions, which a single workshop involving all stakeholders from a given region. This interactive workshop will be facilitated by the National ITS Architecture Team using lectures, discussions and group exercises. Exercises will guide participants on how to use their own region's ITS architecture to support long-range transportation planning, identify ITS projects, support programming and budgeting of these projects, support systems engineering, support project

implementation, and maintain the architecture, i.e., keeping it relevant to changing circumstances.

Cost: Free. Host organization is responsible for providing a meeting room and refreshments.

To Access This Resource: Contact the ITS Specialist at the FHWA Division Office in your state. Contact information or these individuals can be found online at http://www.ops.fhwa.dot.gov/int_its_deployment/its_specialists/fhwa_office.htm.



ITS Systems Engineering (SE) for ITS: Using FHWA's New SE Handbook

This course presents an overview of FHWA's systems engineering (SE) handbook *Systems Engineering for Intelligent Transportation Systems: An Introduction for Transportation Professionals*. The course explains the benefits of SE and in what situations is SE most beneficial. The course shows how to use the handbook and explores steps in the SE process as depicted in a "V" diagram. This interactive Web-based training course ("webinar"), offered March 13, 2007, has been archived in several formats: the MS PowerPoint presentation given, a transcript and an audio recording with simultaneous text captioning.

Cost: Free

To Access This Resource: Access the following website addresses:

- MS PowerPoint Presentation: http://www.pcb.its.dot.gov/T3/s070313/s070313_guide_a.ppt
- Transcript in HyperText Markup Language (HTML): http://www.pcb.its.dot.gov/T3/s070313/s070313_guide_a.asp
- Audio recording using Macromedia® Flash®: http://www.pcb.its.dot.gov/T3/s070313/s070313_guide_cap.html



Regional ITS Architecture Development Process Seminar

This one-day seminar will equip ITS professionals with the information needed to develop their own regional ITS architecture. The seminar will focus on the six-step process described in the document *Regional ITS Architecture Guidance: Developing, Using and Maintaining an ITS Architecture for Your*

Region, Version 2.0. The seminar will address both technical and institutional issues often encountered during the regional ITS architecture development process.

Cost: Free. Host organization is responsible for providing a meeting room and refreshments.

To Access This Resource: Contact the ITS Specialist at the FHWA Division Office in your state. Contact information for these individuals can be found online at http://www.ops.fhwa.dot.gov/int_its_deployment/its_specialists/fhwa_office.htm.



Regional ITS Architecture Development Process Workshop

This two-day workshop will equip ITS professionals with the tools to develop their own regional ITS architecture by helping them prepare a customized action plan to guide them through the process. The discussions will address both technical and institutional issues that stakeholders may encounter during the regional ITS architecture development process. The workshop is conducted in roundtable format, with extensive discussions of situations specific to the participants' own particular region. Participants are expected to be knowledgeable about the National ITS Architecture, as well as their region's transportation planning process. Participants will leave the workshop with a customized action plan, which they can then use as a roadmap to develop their own regional ITS architecture. A single workshop can accommodate from one to four regions, with ITS architecture champions and key stakeholders attending.

Cost: Free. Host organization is responsible for providing a meeting room and refreshments.

To Access This Resource: Contact the ITS Specialist at the FHWA Division Office in your state. Contact information for these individuals can be found online at http://www.ops.fhwa.dot.gov/int_its_deployment/its_specialists/fhwa_office.htm.



What Executives Need to Know About Software Acquisitions

This course presents eight practical steps government executives can take to successfully manage ITS projects that involve acquiring software. Successful practices include providing adequate resources, fostering teaming, attempting to “buy instead of build,” breaking the project into pieces, selecting the right vendor and contracting mechanism, resisting schedule pressure, and emphasizing software quality from the start of the project. This interactive Web-based training course (“webinar”), offered July 12, 2006, has been archived in several formats: the MS PowerPoint presentation given, a transcript that includes the question and answer period, and an audio recording with simultaneous text captioning.

Cost: Free

To Access This Resource: Access the following website addresses:

- MS PowerPoint presentation: http://www.pcb.its.dot.gov/t3/session34/S34_ppt.ppt
- Transcript in HyperText Markup Language (HTML) format: <http://www.pcb.its.dot.gov/t3/session34/session34text.asp>
- Audio recording using Macromedia® Flash®: <http://www.pcb.its.dot.gov/t3/session34/T3%20-%20July%2012,%202006.html>



Approaches for Integrating Systems Engineering into Your Agency’s Business Practices

The course explains how systems engineering (SE) can be applied to an organization’s day-to-day business processes and practices. Case studies from state departments of transportation (DOTs) in Mississippi and Virginia show the approach these agencies used to incorporate SE into the project delivery process. The case studies also explain how needed institutional changes occurred and what products had to be developed in support of the SE application. This interactive Web-based training course (“webinar”), offered August 2, 2007, has been archived in several formats: the MS PowerPoint presentations given, transcripts that include the question and answer period, and an audio recording with simultaneous text captioning.

Cost: Free

To Access This Resource: Access the following website addresses:

- Transcript in HyperText Markup Language (HTML) format (Part 1—FHWA presentation): http://www.pcb.its.dot.gov/t3/s070802/s070802_lopezpresentation.asp
- Transcript in HyperText Markup Language (HTML) format (Part 2—Mississippi DOT presentation): http://www.pcb.its.dot.gov/t3/s070802/s070802_stokespresentation.asp
- Transcript in HyperText Markup Language (HTML) format (Part 3—Virginia DOT presentation): http://www.pcb.its.dot.gov/t3/s070802/s070802_mcelwainpresentation.asp
- Transcript in HyperText Markup Language (HTML) format (Part 4—Question and answer period): http://www.pcb.its.dot.gov/t3/s070802/s070802_systemsengin_qa.asp
- Audio recording using Macromedia® Flash®: http://www.pcb.its.dot.gov/t3/s070802/T3_070802.html

Related Websites

- Federal Highway Administration (FHWA) <http://www.fhwa.dot.gov>
- FHWA Office of Safety <http://safety.fhwa.dot.gov>
- FHWA Turner Fairbank Highway Research Center (TFHRC) <http://www.tfhrc.gov>
- Federal Motor Carrier Safety Administration (FMCSA) <http://www.fmcsa.dot.gov>
- Federal Railroad Administration (FRA) <http://www.fra.dot.gov>
- Federal Transit Administration (FTA) <http://www.fta.dot.gov>
- Maritime Administration (MARAD) <http://www.marad.dot.gov>
- National Highway Traffic Safety Administration (NHTSA) <http://www.nhtsa.dot.gov>
- Research and Innovative Technology Administration <http://www.rita.dot.gov>



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<http://www.resourceguide.its.dot.gov>.

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